THE IRON AGE

THURSDAY, FEBRUARY 2, 1888.

The Hushavel Direct Process.

The main features of the Hushavel furnace consist of a movable hearth fitted to a blast-furnace constructed partly of cast-iron, and partly of wrought-iron plates, the latter forming a double skin to the body of the furnace, the space between the skins being used to heat the blast. The latest furnace was erected in 1886 at Count Strogonoff's Dobriansk Works. It is 26 feet high from the top of the movable hearth; 4 feet diameter at the top, and 5 feet at the widest part. The upper, or fixed portion, rests on four columns, and consists of a double boiler plate structure tapering slightly toward the top. The distance between the two skins is 7 inches; they are connected at top and bottom by horizontal rings, and a spiral partition, making about nine turns, forms an air-passage winding round the inner case. The lower part of the furnace is of the usual form of an inverted truncated cone, and is formed partly of boiler plate and partly of a cast-iron ring, bolted up to the lower horizontal plate which unites the double skins. The thickness of the boiler-plate varies from ½-inch to $\frac{3}{16}$-inch. The lower end of the cast-iron cone is formed into a square with rounded corners about 2 feet 6 inches across, and the whole is surrounded by a sheet-iron case, forming an air-space, which is in communication, by means of two pipes, with the space between the two skins of the upper part of the furnace. From the top of the cast-iron ring upward to a hight of 5 feet, the furnace is lined with fire-brick from 1½ to 2 inches thick, the cast-iron cone and the body of the furnace above the fire-brick is not protected in any way.

The movable hearth is composed of six parts. A bottom casting fitted with four wheels and their axles, a movable false bottom attached to a stalk projecting through the bottom of the hearth, and provided for the purpose of starting the ingot when the hearth is being emptied; two sides each having four tuyere openings in two rows; and two sides with four slag-holes arranged in a vertical row. These pieces are connected by means of bolts and nuts. The upper set of tuyere openings are surrounded by a water-space cast in the plates, and intended to keep the opening cool, and, finally, a pair of trunnions is provided for the purpose of tipping the hearth over and discharging the ingot. The hearth runs on to a platform, placed immediately under the furnace, and is raised or lowered by means of a balanced lever. Three hearths are required for each furnace. The tuyeres are arranged so that they can be readily inserted into any set of apertures provided for them. A complete furnace is composed of about 15 tons of cast-iron and 7 tons of boiler-plate. The furnace was started at the end of June, 1886, but did not begin to work regularly till August in the same year. By the middle of November, 127 tons of ingot had been produced direct from magnetic ore, the ingots, in most cases, having been taken straight from the hearth to the hammer. The fuel used is wood-charcoal. From magnetic ore containing 58 per cent. of iron, 52.4 per cent. of forge steel is obtained, and the loss in producing wrought-iron is stated to be no greater than it is in a puddling furnace. The last issue of the Journal of the United States Association of Charcoal Iron Workers contains a more extended illustrated account of the furnace.

One of our foreign exchanges illustrates and describes a machine for testing steel railway tires by percussion, in use at the works of the Chemin de Fer du Nord, at La Chapelle, Paris. The object of the machine is to give a succession of blows, like those of a sledge hammer, but in quicker succession, more regular in point of interval, and more uniform in intensity. To this end a pair of wheels with their tires shrunk on and keyed on their axle is made to revolve slowly on live rollers, while a couple of sledge hammers are brought down on the tires at regular intervals by a motion like that of the old tilt hammer, a pair of hammer springs being interposed for giving elasticity to the blow.

Coal Conveying Plant of the Knickerbocker Ice Company.

During the past few years developments in the line of hoisting and conveying machinery have been followed with special attention, the economic and rapid handling of materials of all kinds having become a subject of very generally recognized importance. The engraving which we present on this page, showing the coal pockets of the Knickerbocker Ice Company, of Philadelphia, Pa., together with the details on the next page, is therefore of some interest. The plant was built after designs by Messrs. Borden, Selleck & Co., of Chicago, Ill.

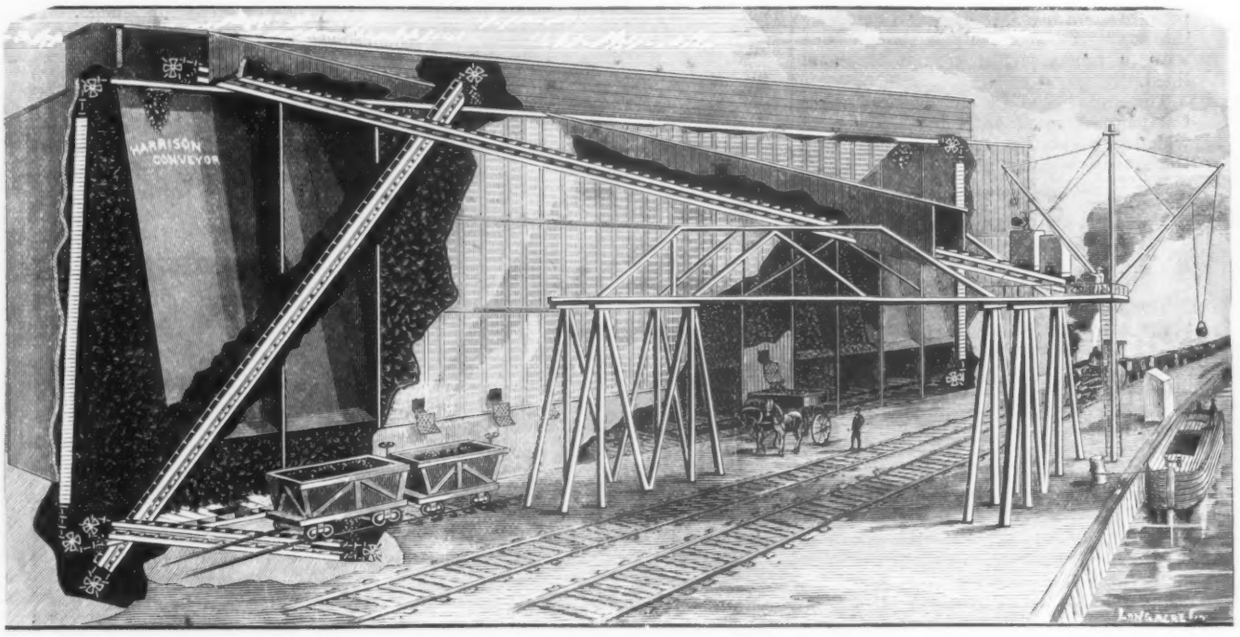


Fig. 1.—General View.

COAL CONVEYING PLANT OF THE KNICKERBOCKER ICE COMPANY, PHILADELPHIA, PA.

Briefly described, the coal, after having been delivered in the hoppers on the banks of the river, is carried by means of what is known as the Harrison conveyer over the railroad tracks to the top of the main building, where it is discharged into another line of conveyers that extends the whole length of the building, nearly 200 feet. This latter line distributes it into the different pockets to be spouted into wagons as it runs over the screens. Immediately behind these pockets are bins which extend from the ground to the top of the building, 38 feet. Coal can be drawn from the bottom of the bins, elevated and placed into any pocket desired by the same line of conveyers. When coal is received by cars it is carried by a line of conveyers located underground which connects with the elevator and main line, thus being distributed to any of the pockets or bins in the building. The entire system is so complete in this plant that after coal is taken from the vessel or car it is not touched by a shovel until after being

placed in the wagon for delivery to the customer. In order to prevent the breakage of coal which would naturally follow in falling from the the top of the building, Messrs. Borden, Selleck & Co. designed a simple but effective device, consisting of shutes so placed that the coal will zig-zag down to the bottom.

The conveyer proper consists of a wrought iron or steel chain, in sections of from 13 to 25 inches in length, firmly joined together by a speciâl form of link, shown in Fig. 4, for holding push plates, as represented in Figs. 3 and 5. The type of chain is such as to prevent any pieces of coal lodging on it to be carried beyond the desired point of delivery, or to be crushed between the chain and sprocket-wheel (Fig. 6). When coupled together, the chains, with push plates, are operated over these wheels at each angle or change of direction, and run through a wooden or composite trough, made necessarily to conform to the shape of the push plates. A general view of one of these troughs is given in Fig. 2. The natural drift of material being toward the center or lower point of the trough, it is swept along by the conveyers as cleanly as though done with a broom. The trough is metal lined.

The engine used by the Knickerbocker Company is rated at 20 horse-power, of which only a portion is required for driving the conveying plant.

Machine Shops at West Burlington, Iowa.

The West Burlington Railway machine shops consitute one of the most valuable and important pieces of property in the Mississippi basin, and any statistical account of industries in the State of Iowa, especially of the city of Burlington, would be incomplete if these shops which are located within the city limits were omitted. The Chicago, Burlington and Quincy Railway Company own about 1000 acres of land on which are located the shops, the city of West Burlington, Murray Iron works and the C., B. & Q. reservoir. The shops have on their pay-roll the names of about 1400 men, and the Murray Iron Works, 200. The principal buildings, with dimensions in feet, are: The erecting shop, 320 x 130; Murray Iron Works, 310 x 108; storehouse and offices, two stories, 56 x 302; blacksmith and boiler shops, 203 x 130; engine and boiler shops, 141 x 56; wood machine shops and planing mill, 200 x 76; freight car erecting shops, 222 x 91; passenger car erecting shops, 222 x 91; paint shop, 250 x 91; dry kiln, 150 x 75; round house for 10 engine stalls. There are many other minor departments, particulars of which we cannot now give. In the second story of the storehouse, 56 x 302, is a large and complete dry goods store containing the various textile, rubber and oiled goods used in car upholstery.

The buildings are all heated by steam and connected by telephone. Tunnels below and cranes above are so arranged as to readily and easily move even the heaviest locomotives to any part of the shops. The motive power is furnished by one 370 horse-power engine. The blacksmith shop presents one of the busiest scenes. In the boiler shops are many pieces of machinery worthy of notice, one in particular for the rivet-work in boilers. In the engine erecting shops are now being built seven new engines, two of which are for the Hannibal and St. Jo Railway. The shops not only do work for the C., B. and Q., but for many railway companies throughout the West. One of the most powerful pieces of machinery is the overhead crane in the engine shops, by which any of the largest engines can be picked up and moved to any part of the building. The frame-work was built in the shops and the lifting apparatus came from Philadelphia.

One of the most extensive departments of these shops is where the freight cars are built or repaired, another where the fine passenger coaches are erected, or repaired. Of the lesser may be mentioned the cabinet shop, where all the patterns are made, the upholstery, the telegraph shops, where apparatus belonging to the telegraph is manufactured. The planing mill or carpenter shops are large and complete. From them the shavings are taken through pipes by air suction to the furnace.

Emmensite.

In view of the growing interest attached to explosives, it may not be amiss to direct attention to a new compound of this kind, the peculiarities of which we had occasion to examine a short time ago. It is called Emmensite, after the name of its inventor, Dr. S. H. Emmens, of New York.

The explosive, in its simplest form, consists of two ingredients, one of which is a new nitro-derivative of certain hydro carbons of the aromatic series, and can be prepared by the distillation of coal at a low temperature, while the other is a mineral salt found in certain localities in vast quantities. Perhaps the most singular feature of this new explosive is its capability of being fused. It may be melted and cast into any desired form. When thus treated a lump of emmensite will burn quietly, producing a very brilliant and smokeless flame which may be made to assume a vivid crimson, blue, purple, green or other hue by the addition of ordinary coloring ingredients to the fused mass before cooling.

For pyrotechnic, theatrical and signaling purposes the compound thus seems to offer readily apparent advantages. By increasing or diminishing the size of the grains a powder of any desired quickness of action may be secured, thus enabling its use in firearms and also for the ordinary purposes of high explosives. Subjecting the explosive to hammer blows on an anvil and passing it through a rock-breaker when in a caked form, due to melting and subsequent cooling, produced no disastrous effects, incredible as it may seem, Dr. Emmens explaining that a fulminating action only can bring about an explosion. Hence, it will be understood that the explosive can be handled with entire safety. There is no danger whatever of accidental explosion.

A number of firing tests which we saw made seemed to demonstrate very strikingly the superiority in point of destructiveness of emmensite over a number of other forms of well-known explosives. Its explosive power is estimated as equivalent to a pressure of 283 tons per square inch. This, we believe, is considerably in excess of the figures claimed for other leading explosives. The estimates for these have been given us as follows:

Nitro-glycerine	264 tons per square inch.
Explosive gelatine	253 tons per square inch.
Forcite	250 tons per square inch.
Oxomite	249 tons per square inch.
Panclastite	203 tons per square inch.
Gun cotton	198 tons per square inch.
Dynamite No. 1	144 tons per square inch.
Atlas B	133 tons per square inch.
Rackarock	117 tons per square inch.
Roborite	24 tons per square inch.
Blasting gunpowder	23 tons per square inch.

It is of interest to note here also that Dr. Emmens has produced what he calls a neutralizing powder. One of the most serious objections to the use of dynamite and other high explosives in mines and tunnels is the production of noxious fumes and gases. This neutralizing powder is a chemical compound, which we are told may be added to the explosive without any diminution of strength, and which, when fired, generates certain vapors that neutralize the dynamite fumes. Work may thus be resumed in a much shorter time than usual, and the health of the laborers is preserved.

The explosive is under the control of the Emmens Chemical and Explosives Company, of New York.

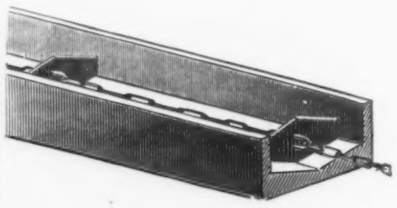


Fig. 2.—View of Trough.

Fig. 3.—Chain with Push Plates Attached.

Fig. 4.—Link for Plates.

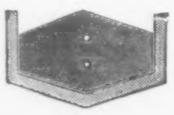


Fig. 5.—Section of Trough.

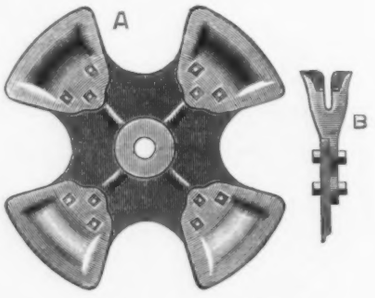


Fig. 6.—Sprocket Wheel.

DETAILS OF COAL CONVEYING PLANT OF THE KNICKERBOCKER ICE COMPANY, PHILADELPHIA, PA.

The Wheeling and West Virginia Natural Gas Companies, of Wheeling, W. Va., have consolidated with a combined capital stock of $2,000,000, each corporation putting in $1,000,000. Five directors from each will be elected. The consolidated company will be known as the West Virginia Natural Gas Company, and will have 28 wells, all in the Taylorstown district.

Disks for Increasing Cooling or Heating Surface of Pipes.

In the description of the De La Vergne refrigerating machine published in our issue of January 19, we referred, among other things, to an arrangement of cast-iron disks which the builders used on their expansion coils for increasing the effective cooling surface. We take pleasure in presenting now two engravings, one of them showing a disk as applied to a pipe, and the other representing one of the halves of which each disk is composed.

The manner of attachment to the pipes is made perfectly clear in the illustrations. Each half of a disk has cast on two lugs projecting laterally on both sides and having slightly inclined surfaces. When the two parts are put together, as shown in Fig. 2, the lugs in both correspond, and a firm union is effected by slipping over each pair of lugs an iron cap, shown on the left side of the engraving. The gripping pressure capable of being exerted in virture of the slanting sides of the lugs and caps is sufficient to keep the disks in proper position on the pipes. The efficiency of these disks is shown by the fact, mentioned by the De La Vergne Refrigerating Machine Company, that since applying them to their cooling pipes they need only 1 foot of pipe where formerly they required four. It is perfectly evident that a corresponding effect can be secured by their use on heating pipes. The transmission of heat in such a case could be increased or diminished according to the number of disks applied to each lineal foot of pipe.

We understand that three sizes of disks are made, two round, 10 inches and 14 inches in diameter respectively, and one of oval shape, 10 x 15 inches, in order to accommodate them to the room and purpose to be accomplished.

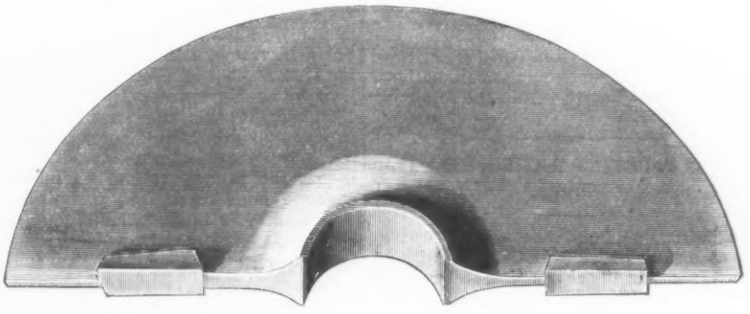


Fig. 1.—Half Section of Disk.

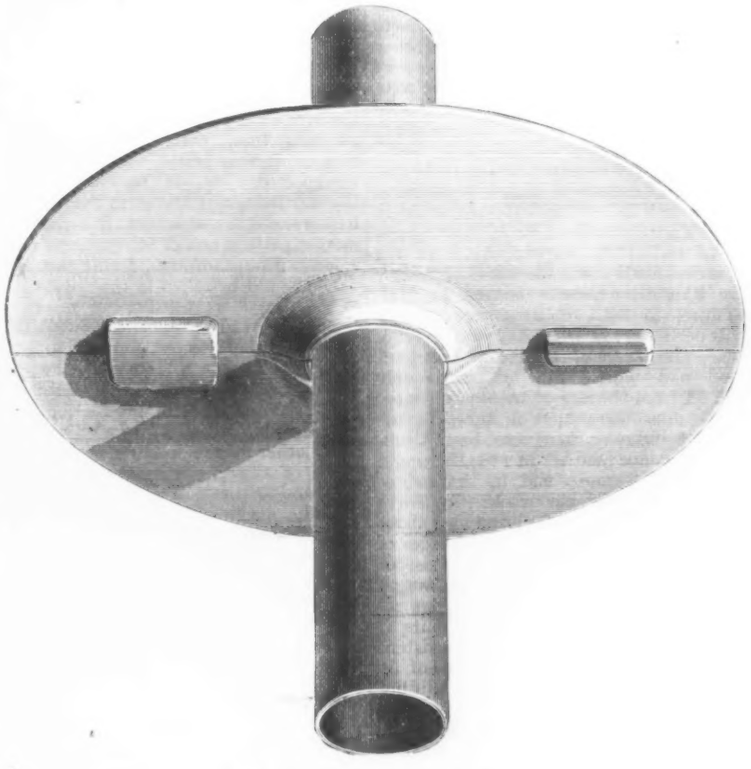


Fig. 2.—Disk Attached to Pipe.

DISKS FOR INCREASING COOLING AND HEATING SURFACE OF PIPES.

The American Ocean Marine.

Shall our mercantile marine be revived? This question is now fairly before the whole country, through the persevering efforts of the American Shipping and Industrial League, and all eyes will be fixed upon Congress for an answer before the close of the present session. It is seen that while our Lake commerce is prospering as never before and calling into existence a splendid fleet of steamships, wholly the product of American skill, our ocean commerce is wholly under a foreign flag, to which American shippers are paying in the shape of freight money more than $100,000,000 per annum. Our industrial establishments secure from this expenditure no impetus; our seamen derive from it no advantage.

A member of one of the oldest and most successful shipping firms in New York remarks that "it is clear with the routes of commerce in the hands of our competitors, that for some time to come bounties and subsidies for mail service will be necessary to induce capital to embark again in what for years past has been an unprofitable business." In truth, it is notorious that American shipping under the present existing conditions offers no inducements whatever to investors as compared with other forms of property. It is equally well known that what little remains of our ocean marine is for sale at prices below those of foreign countries. It is obvious from the discussions which have taken place in the conventions of the American Shipping and Industrial League that the great body of shipbuilders and ship owners in the United States, men of the largest practical experience, are now agreed as never before that the "free ship" remedy proposed is wholly inadequate if not positively absurd. On this point there is a powerful concensus of opinion. Arthur Sewell, of Bath, Maine, one of the most eminent shipbuilders in that State, may not inaptly be quoted as representing the true American idea. He says: "Our shipping has to face the overwhelming influence of England, the subsidized shipping of France, Italy, Spain and Germany. The question, as it now stands, is simply whether it is better to expend a certain sum of money to save this industry, or whether it is better to save the money and part with the industry. There goes out from this country a fabulous volume of goods of every description. These goods are exported in the ships of our competitors. Such representation as we have in foreign markets depends upon them, and their interest is to turn trade in favor of their own countries. The Germans, the French, the Spanish, the Italians have had free trade in ships for many years, but still found themselves obliged to resort to some plan which would prevent the loss of their merchant marine and all that is implied in its loss. The fatal mistake which they all make is in continuing their free trade in ships; subsidy or bounty must not be associated with free trade. It is a narrow view which considers alone the ship owners' interest in this question. It concerns far wider interests. The relief of the ship owner has not been the primary object of foreign governments in coming to his relief."

What is known as the Nagley tonnage bill, now before Congress, is strongly supported. This bill provides that every vessel, sail or steam, built and owned in the United States, trading with foreign ports, shall be allowed 30 cents per ton for each 1000 miles sailed or steamed for a period of 20 years, one-third reduction of said rate to be made at the end of the first 10 years from the date the act of Congress shall take effect. Although the Government aid asked for is much less than is conferred by similar measures approved by foreign powers, the belief is entertained that it will prove sufficient to place American shipping on a basis, for a specified term of years, where it may contend successfully with foreign rivals until permanently established.

While Americans hesitate in regard to their maritime policy Great Britain is making gigantic strides, until, as remarked by the London *Times*, "the shipping supremacy of England remains to-day greater and more manifest than it has ever been before." The statements of the growth of the merchant navy of the United Kingdom, prepared by the British Board of Trade,

presents some startling facts: In 1880 the total tonnage on the British register was 6,519,772 tons. In 1886 the total registered tonnage was 7,321,335 tons, a gain during the interval of about 800,000 tons, a gain equivalent to two-thirds of the entire tonnage of the United States engaged in what is termed over-sea trade. The Germans, too, are thoroughly aroused to a sense of the importance of extending their ocean traffic and are becoming a strong maritime power. While in 1875 61.8 per cent. of the tonnage that entered and cleared at German ports was foreign, and only 38.2 per cent. national, in 1886 42.2 per cent. was national and 57.8 per cent. foreign tonnage. The United States, which in 1875 stood third among the great commercial nations, dropped to the fourth within the following decade.

Wages Paid in the English Iron Trade.

A large Blue Book has been issued in Great Britain which contains a return of the wages paid in the iron and allied trades during the last half century. The *Iron and Steel Trades Journal* reviewing it finds that the wages of iron founders in Manchester were 31/3 per week in 1810. They rose to 35/10 in 1818, and in 1832 they stood at 28/ to 30/. It appears that in 1883 it was possible for skilled hands to earn somewhat higher wages than they had earned 50 years before. In several instances the difficulty of making a comparison between one year and another is increased not a little by the contradictory figures given in different parts of the book. We are told, for example, in one table that the wages of colliers in South Wales were 18/ per week in 1844 and 19/ per week in 1845. The next table reduces these figures to 13/ and 16/2 respectively. In the statements made about the wages of miners some like discrepancies occur. In Staffordshire, in 1846, colliers were earning 19/10 per week; in 1849 they were earning 16/3. The wages of miners at the later period had more than proportionately fallen off from the rate of 1846. But more recent tables show that in these departments of industry there has been a substantial advance made. In 1883 the wages of colliers at Swansea and in the neighborhood were 26/ per week. In North Staffordshire in 1880—the latest year about which particulars are given—the wages of coal hewers were 4/ per day, and those of colliers were the same. Glasgow wages were a little above these, coal hewers receiving 25/3 per week, but for 60 hours of labor, whereas in the North Staffordshire district the working week consisted of 54 hours. The tables about the building trades take us down only to 1834, and do not refer to many centers of the building industry. We learn that at Manchester carpenters earned 25/ per week in 1810, bricklayers 22/6, and painters 22/. In 1825, after various intermediate fluctuations, carpenters earned 24/, bricklayers had risen to the same sum, while the wages of painters had remained throughout at the 22/ with which they started in 1810. In 1832 we find carpenters still earning 24/ per week, but bricklayers only 17/ to 20/, and painters only 18/.

Some of the most important industries of the country have come into being at a later date than that from which the tables start. In iron shipbuilding shipsmiths received in 1859 3/8 per day at Liverpool; joiners received 4/5½ in each case for a day of 10 hours. In 1880 shipsmiths earned 34/ per week for 54 hours' work, and joiners 34/6, a very substantial advance in each case upon the wages of 1859. In Sunderland, in 1883, some of the workmen in iron shipbuilding were more highly paid still. The workmen employed on piecework could earn as smiths 52/ per week. This we know personally to be incorrect, as we are aware that shipsmiths and fitters earned as much as 90/ per week during the last "boom." On the whole the details given in this government return are misleading, and practical men could put their finger on many inaccuracies. Sheffield saw-makers received in 1840 27/ per week, 29/6 in 1850 and 32/ in 1860 for 48 hours' work. In 1874 they received 30/, but the working week was then but 36 hours. Grinders in the three earlier years earned 54/ per week. In 1874 they earned only 40/. In the wages of file-makers, and, indeed, in very many of the departments of the iron and steel industry, the Sheffield rate of 1840 is above that shown for 1871. About gun making in Birmingham we have two tables, one referring to 1866 and the other to 1880. The headings in the two differ very considerably, but the general conclusion to which they point is that the average rate of wages has not changed much in the 14 years' interval. The book is a bulky volume, but it can hardly repay perusal, and those most familiar with the wages paid in the iron and engineering industries will largely discount its utility.

Rapid-Firing Arms.

Lieut. W. W. Kimball, United States Navy, writing on "rapid-firing arms," in *Engineering*, says that the desire for obtaining in a given time the discharge of the greatest number of projectiles from the least number of guns was co-existent with the invention of firearms. It has even been asserted that, before Friar Schwartz's famous mortar-pestle had completed its unexpectedly begun trajectory through the startled air of Mayence, the good monk had grasped the idea that, if a great many mortar-pestles could be quickly thrown among groups of men, a long step in advance would be taken in the investigation of the always interesting, but never satisfactorily solved, problem of how, in battle, to destroy the greatest number of human lives in the shortest possible time. The early attempts at the solution of this problem resulted in the production of the ribaudequins, orgues, orgels, tube and many other muzzle-loading multi-barreled guns; of the crude breech-loading small arms and artillery, of the revolvers, pistols, shoulder-pieces and artillery; and of the repeating muskets, devised for loading with several charges superimposed upon each other; all of which kinds of arms appeared in the period extending from early in the fifteenth to the middle of the nineteenth centuries, when metallic-cased cartridges came to the fore and rendered practicable breech-loading and other devices for increasing rapidity of fire.

The residents of the northern peninsula of Michigan are very much interested in the completion of the international bridge over St. Marys River, between Michigan and Canada, which was opened with appropriate ceremonies on the 18th ult., By means of this bridge uninterrupted rail communication across the continent through the northern peninsula has been secured. It will be used jointly by the Canadian Pacific, the Minneapolis, Sault Ste. Marie and Atlantic and Duluth, South Shore and Atlantic roads, which center at Sault Ste. Marie, on the American side of the river. In the fall of 1886 the erection of this bridge was definitely decided upon. Work on the masonry was begun in May, 1887, and December 31 the first train crossed the structure. Inside of three months this great superstructure of ten spans, each of which is 242 feet in length and weighs about 250 tons, was begun and completed. There are two spans of 105 feet across the main channel. The draw is next to the largest in this country. The style of the bridge is a "pin truss." It is 16 feet above the water, while the trusses extend upward of 40 feet. The main bridge is 2420 feet in length, is joined by 2000 feet of trestlework across the island and then two spans of 105 feet each across the north channel. The entire length of the structure, swing, main bridge, trestle, and all from abutment to abutment on the mainland on either side is 5400 feet. The bridge proper cost about $700,000. The engineers of the structure were G. H. Massey and R. G. Reid, both of Montreal.

Gas Engines for Street-Car Propulsion.

Various attempts have been made to substitute gas and electricity for steam and horses. With the first no success has been obtained, for it is necessary to use an engine of at least 20 indicated horse-power to run an ordinary street car, because less will not suffice for brief violent efforts in starting the cars and ascending steep inclines. A pair of good horses can exert a pull of quite 1300 pounds for a short distance. At a speed of only three miles an hour this amounts to 10 indicated horse-power, and is actually often exerted, horses being able, for short periods, to put forth at least five times more than their normal power. But 10 horse-power would not suffice for a gas-impelled street car, because it will weigh much more than the ordinary street-car. Still there does not appear to be any insuperable difficulty in the way. The gas engine mounted on the tram car must run continuously, because a gas engine cannot be stopped and started like a steam engine, and some form of gearing must so couple it to the wheels of the car that the engine running without change of speed may be able to propel the car at velocities rising from a few feet per hour to eight miles. Cone pulleys and belts will not do. The storage of sufficient gas for long runs is quite an easy matter, that can be accomplished, say on Pintsch's system, without trouble. Concerning electricity it is enough to say that the storage battery is as yet unable to compare favorably in working expenses with horses, to say nothing of steam.

The large car built at the Lehigh Valley railroad shops at Packerton, and used to transport the heavy machinery which the Bethlehem Iron Company imported from England for use in the new steel forging works, is now at the Lehigh Valley yards at South Bethlehem, Pa. The car weighs 26½ tons, and has a carrying capacity of 100 tons. It is supported by six four-wheel trucks, and all the material used in its construction is iron, except the floor, which is of heavy oak.

A new form of street rail and car-wheel which, it was thought, would overcome many of the objections now urged against those in general use, was shown us a few days ago at the establishment of Mr. Eugene R. Peyser, 383 Broadway, New York. The rail and wheel are the inventions of Mr. S. M. Jacobs and in some respects present commendable features. The rail is of the grooved type, and is to be laid flush with the pavement, and the groove, which is of V-shaped section, is to be made of such scant width that it will be impossible for any of the wagon or carriage wheels now in use to be caught in it. The wheel-tread naturally is V-shaped also and is slightly serrated with the view of cleaning out the groove in the rail should this become clogged with dirt, snow or ice. In a modified form of Mr. Jacobs' rail, the groove is slotted at different points, so that any accumulations in it can drop into a trough arranged after the manner of a conduit.

The Interstate Commerce Law.—IV.

PUBLICATION OF TARIFFS.

The section of the law which provides that all tariffs and classifications of our railways shall be made public, and that the rates therein contained shall not be departed from either for or against any shipper or shipment, is one which has the approval of all students of our transportation problem, however much they may think the pooling and other sections unwise. Under a form of government and customs which depend so largely upon public opinion, compulsory publicity of all corporate and quasi-public affairs is often the only step necessary to effect any needed reforms. The grossest forms of personal discrimination, whose wrongs appeal most clearly to our sense of justice, are prevented. Some doubt having been expressed whether joint rates as distinguished from through rates were covered by this section, Senator Cullom's proposed amendment clears up any possible obscurity. The question of what constitutes a through rate may yet have importance. If we define the term as meaning a rate in which all the carriers participate according to a percentage, then for example the export rates from Chicago to Liverpool are not through rates, since only the charges from Chicago to New York are prorated, the fixed ocean rates being added thereto. If this definition be true, then under any complaint of violation of the short haul section by the seaboard cities, not the Chicago-Liverpool, but the Chicago-New York charges on exported grain or provisions must be compared with the Chicago-New York domestic rate. As these domestic freights are higher, a clear case would be made out. It all depends whether the words "greater compensation in the aggregate" do or do not include the ocean charges of carriers not covered by the act.

THE COMMISSION.

Governing by a commission is peculiarly an Anglo-Saxon idea, and so far in English and American history its advantages have overbalanced its defects. On the Continent of Europe the management of great matters is committed directly to the hands of government. But when the wish is to put as few of the instrumentalities of trade as possible out of private control, the commission is a compromise by which is attempted to combine the advantages of this latter plan with such an oversight of government as will secure justice in disputed cases. There is no question that the plan is, under our political conditions, better than any yet devised. In addition to the powers of the commission as defined in the original bill, Senator Cullom's amendments make it also competent to name the amount of damages where such are claimed, the decision being *prima facie* evidence before any competent court where such award may be sought to be enforced. The powers of the commission are also somewhat enlarged as regards subpœnas, and in other minor points. In section 13 it is provided that no complaint shall be dismissed because no direct damage can be shown. If this principle should be by degrees adopted into our statute law, it would naturally modify the position of carrier and shipper in some important points. The rule of the court compelling the proving of direct damages has often operated to defeat the ends of justice. The railroads have often escaped payment of damages in cases of delay for example when they were clearly negligent, and the loss of business and annoyance to the merchant equally clear, though not easily stated in exact dollars and cents.

EXCEPTIONS.

Section 22 excepts from the operations of the law the issuance of mileage, excursion or commutation tickets, providing, of course, that such tickets be sold to all alike. Our railroads, at first inclined to exact full fares without deviation, are now issuing special tickets which can be used by commercial travelers and others. It is probable that passenger fares will be graded, as they should be, according to frequency of travel and numbers in parties, the only effect of the law being that such reduced fares shall be applicable to all entitled to them.

CONCLUSION.

The constitutionality of the law is no longer called in question. The general principles upon which it is based are such as commend themselves to all interested. We do not need at present any radical changes or amendments beyond those necessary to secure greater clearness. As it stands, the law practically represents the experience of the English commission with that of our own history, and hence is not merely an untried experiment. What improvements can be safely introduced must be left to time to determine.

Our Production of Pig Iron in 1887.

Through the continued courtesy and more than ordinary promptness of the manufacturers we were enabled in the *Bulletin* of the 18th ult. to give to our readers the full particulars of the production of pig iron in the United States in 1887, together with a detailed account of the stocks of pig iron which were unsold in the hands of makers or their agents at the close of the year. We now recur to these statistics for the purpose of pointing out a few of their significant features.

Our production of pig iron in 1887 was 6,417,148 gross tons, against 5,683,329 tons in 1886 and 4,044,526 tons in 1885. Our increased production in 1886 over 1885 was over 40 per cent.; in 1887 over 1885 it was over 58 per cent., and in 1887 over 1886 it was about 13 per cent. Such extraordinary and amazing progress could not, of course, be maintained, and the year 1888 will witness a decline in our production to a point somewhere near the figures of 1886. The total production of pig iron in this country since 1880 has been as follows:

Years.	Gross tons.	Years.	Gross tons.
1880	3,835,191	1884	4,097,868
1881	4,144,254	1885	4,044,526
1882	4,623,323	1886	5,683,329
1883	4,595,510	1887	6,417,148

The production of pig iron in the last half of 1887 was very much larger than in the first half, as the following figures will show:

Production.	Gross tons.
First half of 1887	3,049,295
Second half of 1887	3,367,853

Our production of pig iron in 1887, classified according to the fuel used, was as follows, in net tons, compared with the production in 1885 and 1886:

Fuel used.	1885.	1886.	1887.
Bituminous	2,675,635	3,806,174	4,270,635
Anthracite	1,454,390	2,099,597	2,338,389
Charcoal	399,844	459,557	578,182

The anthracite figures include all pig iron made with mixed anthracite and coke, as well as that made with anthracite alone.

Allegheny County, Pennsylvania, made a great stride forward in 1887 in the production of pig iron, making 897,849 net tons. The Lehigh Valley also eclipsed its previuos record, making 722,939 tons. Ohio came very near making a million net tons of pig iron in 1887. Pennsylvania, of course, still keeps far in the lead of all the States. New York largely increased her production in 1887 over 1886, while New Jersey, Illinois and Michigan made creditable progress last year. Missouri and Wisconsin each about doubled their production, and Colorado with but one furnace shows a good record of 25,291 net tons. Only one furnace on the Pacific Coast, located in Washington Territory, was in blast during 1887.

The production of pig iron in the Southern States in 1887 was as follows, in net tons, compared with the production in 1885 and 1886. We omit the production of Missouri, which we class as a Western State:

States.	1885.	1886.	1887.
Alabama	227,438	283,859	292,762
Tennessee	161,199	199,106	250,344
Virginia	163,782	156,250	175,715
West Virginia	69,007	98,618	82,311
Kentucky	37,553	54,844	41,907
Georgia	32,924	46,490	40,947
Maryland	17,299	30,502	37,427
Texas	1,843	3,250	4,383
North Carolina	1,790	2,300	3,640
Total	712,835	875,179	929,436

The production of pig iron in the Southern States in 1887 did not equal the general expectation, being only about 50,000 net tons in excess of the production in 1886. But the fact is not so fully considered as it should be that the South, during the past two years, has really only been getting ready to greatly increase its production of pig iron. It has within that time undertaken the erection of more than 30 large blast furnaces, but of these only eight were completed down to the close of 1887—namely, two in Virginia, four in Alabama and one in each of the States of Kentucky and Tennessee. Nineteen furnaces are now under construction in Alabama, three in Tennessee, two in Maryland and one in Virginia. Many of these will be finished in 1888.

Our production of spiegeleisen in 1887, included in the figures already given of the total production of pig iron in that year, was almost exactly the same as in 1886, when it amounted to 47,982 net tons, and in 1887 to 47,598 net tons.

The stocks of pig iron which were unsold in the hands of manufacturers or their agents at the close of 1887, and which were not intended for the consumption of the manufacturers, amounted to 337,617 net tons, against 264,717 net tons on the 30th of June, 1887, and 252,704 net tons on the 31st of December, 1886. In addition to unsold stocks in the hands of manufacturers at the close of 1887, there were also about 28,000 net tons of unsold pig iron in the hands of various other parties in Virginia, Pennsylvania, Alabama, Tennessee and Michigan.

The number of furnaces which were in blast at the close of 1887 was 339; the number out of blast was 244. Others have since been blown out.—*Bulletin Iron and Steel Association.*

Herr J. Puling, of Vienna, has devised an ingenious method of rendering visible the form of a stretched string set in vibration, by having one of its extremities attached to one prong of a tuning-fork, which was kept in motion electrically, and gave a definite note, the pitch of which was carefully determined. The vibrating string was lighted up by a vacuum tube connected with a Rumkorff coil, the rate of discharge through the tube being alterable at will, and when this was made equal to or some aliquot multiple of the number of vibrations made by the string, the latter was only illumined when occupying some one definite position, and, owing to the persistence of its image on the retina, appeared as if at rest. In this way the shape of the string and the positions of the modes and vertical segments were rendered clearly visible.

In Supreme Court, Part I., New York, before Judge Barrett, a jury gave a verdict of $13,255.88 against Hugh J. Grant, sheriff, in a suit brought by James H. Fay, assignee of Marshall Lefferts & Co. The sheriff is secured by a bond given by A. K. Lissberger.

Heating of Buildings by Forced Circulation of Warm Air.

In view of the interest which has been evinced in connection with the heating and ventilating of various forms of buildings, we take pleasure in referring more particularly to the accomplishment of these objects by a forced circulation of warm air. This system has already been very favorably commented upon, and has, in a large number of cases, yielded highly satisfactory results. In large buildings the furnace has generally been found inadequate; either a number being required or, more frequently, it being impossible to secure a proper circulation of the heated air. The same difficulty arises with the ordinary methods of steam heating by indirect radiation; and, for this reason more than any other, the direct steam-heating system has been generally adopted. It has, however, the disadvantage of snapping and hammering in the pipes, of constant danger from leakage, freezing or fire, and of great expense, both in the original lay-out and in any necessary repairs. In neither of these methods, moreover, is any adequate provision made for the proper ventilation of the rooms heated.

The disadvantages of all of these systems may be avoided by making the circulation of the heated air positive by means of a fan blower. In any building fitted for steam heating it is obvious that the motive power is already at hand for driving the fan. In many cases it may be that there are sufficient arrangements of shafting to make connections with a pulley fan. But, all things considered, it will be found preferable, as a rule, to drive the fan by a direct-connected steam engine. It then becomes independent of any other source of power, may be run at any speed, and at any time. The ordinary objection raised to this means of fan propulsion is, that it costs too much to run the engine. Primarily it is evident that much unnecessary loss by friction is avoided when the engine is directly connected to the fan shaft in place of driving the fan through a system of belting and shafting. But, above all, it costs practically nothing to drive the engine when the exhaust steam from it is utilized (as it always should be) in the steam heater connected with the fan. The heating power of live steam, of 70 pounds pressure, is only slightly greater than that of exhaust steam; hence, pound for pound, it makes but little difference in the expense which is employed. For this reason the engine cylinder may be considered as simply an enlargement of of the steam pipe on the way to the heater, and the exhaust steam leaving it practically as efficient for heating as live steam direct from the boiler.

The fan for propelling the air should be of the type which delivers the air around its periphery, for the disk or propeller fan cannot force air against any considerable pressure. The heater, fan and engine, for this work, are usually made by the manufacturer into a combined apparatus. Mr. B. F. Sturtevent, of Boston, Mass., was, we believe, the first in this country to put such an article on the market. Through his courtesy, a cut of his steam hot blast apparatus is here presented. The direct connected engine is stiff and substantial, of good workmanship, and capable of running at high speeds. The fan meets the requirements of a ventilating fan—namely, ability to handle large volumes of air at low pressure with the least expenditure of power. The heater, however, is the most distinctive part of the apparatus. It consists of a series of hollow cast-iron sections or bases divided by a diaphragm midway of their length, and into which is screwed a triple vertical row of wrought-iron pipes, which, by means of horizontal connecting pipes at the top (seen in the cut of the heater), serves as a means of communication between the ends. Steam is admitted to one end of these sections by independent supply pipes, and finds its way up, over and down through the pipes to the other end of the section, whence it is removed by means of a steam trap. This arrangement insures a positive circulation of the steam through the entire heater. In hot weather, cold water or refrigerating liquids may take the place of steam, thereby cooling instead of heating the air. The entire apparatus is compact and occupies but little space, and may be placed in any convenient position in the basement. Air from out of doors is led by means of suitable passages to the end of the heater (or air, when pure enough, may be taken from the apartment in which the apparatus stands), through which it is drawn by the suction of the fan, the inlet of which connects with the heater. The steam pipes are so arranged that the air is compelled to take a more or less zig-zag course in passing between them, being thus brought into intimate contact with every foot of pipe. This results in one of the marked characteristics of this method of heating. The constant bringing of cooler air in contact with the pipes causes a condensation of steam much greater than that which takes place in an open radiator. The amount of heat given out is measured by the weight of steam condensed; hence the greater the amount condensed per

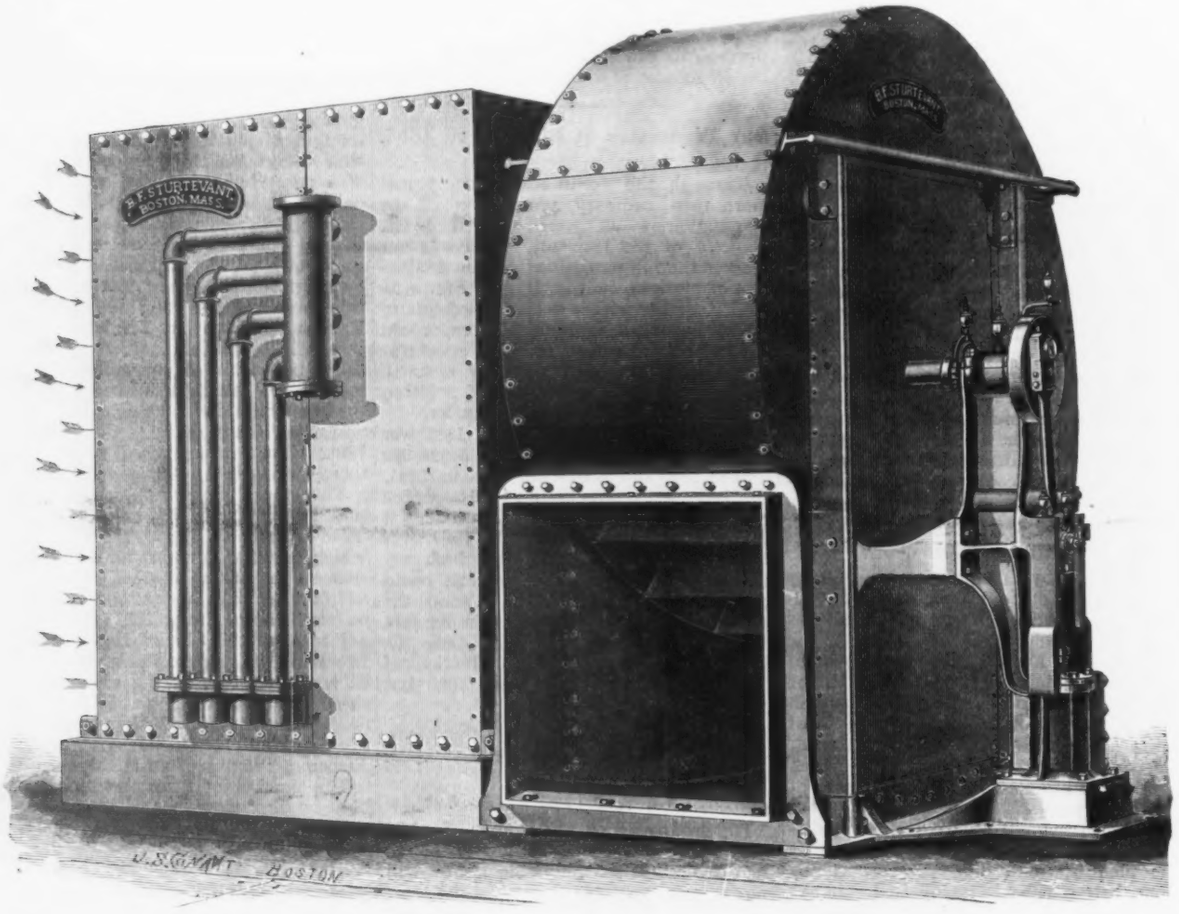


Fig. 1.—The Sturtevant Steam Hot Blast Apparatus.

HEATING OF BUILDINGS BY FORCED CIRCULATION OF WARM AIR.

square foot the less the number of square feet required to do a given amount of heating. In the hot-blast apparatus which we illustrate this efficiency is increased three to five fold—or, in other words, 66⅔ to 80 per cent. of the pipe is saved when this system is adopted in place of one of direct radiation by means of steam coils strung around the rooms. Furthermore, instead of having air cocks and valves all over the building, and steam pipes liable to leak, freeze or cause a fire, there are required in this system only a few valves on the engine and heater, and these are but a few feet apart. An item that often pays for the introduction of the apparatus is that of reduced insurance rates, the amount saved being sufficient to pay the interest on the cost of the plant, for the heater is entirely inclosed in a steel plate jacket and only air of a moderate temperature is conveyed through the flues to the various parts of the building.

The heated air discharged from the mouth of the fan is conducted to the different apartments by a system of ducts and flues, dependent in their arrangement upon the construction of the building and the use to which it is put. The manner of distribution for stores and office buildings is much like that employed for distribution of furnace heat—by means of metallic pipes. However, when possible in the construction of such buildings, particularly when of brick or stone, it is advisable to build the vertical flue into the walls. If desired, the fan may be constructed to discharge the air into a series of underground horizontal ducts connecting with the various vertical flues. These flues should be of ample size, and here it may be said that, although it appears simple enough to lay out such a system, it in reality requires the experience gained by one who has been extensively connected with such work. If made too large the flues nearest the fan are apt to take more than their intended share of the air, or, if too small, the air seeks a readier delivery elsewhere. They should be as straight as possible, having no great or sudden expansions and contractions, and in brick or stone structures they should be smoothly plastered or lined with tin or special tiles. The velocity of the air through them should be moderate, in order not to cause unnecessary loss of power and pressure by friction. In buildings of the construction here indicated it is generally advisable to bring these flues up in the interior walls. The air, like that from a furnace, may be admitted to the various rooms through registers in the walls or floors. But these outlets must be placed with care so as to secure the most complete circulation of the air throughout the apartments before its discharge. For small offices a single register will be sufficient, and when there are few occupants no special means need be provided for the removal of the spent air. The slight pressure created in the room by the excess of entering air causes a ready escape of other air through cracks and crevices. In rooms having a large number of occupants, and having no adequate means of removing the vitiated air, eduction flues should be provided at proper places in the walls.

The need of some such means not only of heating, but of ventilating, is most urgently felt in large retail stores and some office buildings. We have been convinced of this fact forcibly by daily experiences. In stores the registers may be placed in the aisles, in the walls near the floor, under the counters and in many available places, and the vitiated air may be readily removed through eduction flues in the walls or ceilings. Not only is the comfort of the purchasers greatly enhanced, but the working ability of the employees in some establishments has been found to be increased 10 to 15 per cent. The great difficulty which arises in the heating of many structures is due to the fact that at the time of erection not even reasonable thought was given to the manner of heating, and it was adapted to a greater or less extent to the building after it was partially or wholly completed. The advantage of adopting the system of heating by forced circulation of warm air before erecting the building seems obvious. It is then no expense to build in the required flues and ducts. Although more expensive after the building has been erected, yet it can be, and has been repeatedly, adapted to buildings of all descriptions years after their erection.

We understand that Mr. Sturtevant has in press an extensive and well-illustrated treatise on "Ventilation and Heating—Principles and Application," to the perusal of which we look forward with pleasure, for his quarter century of experience must have yielded a rich harvest of important facts and information regarding this subject. The treatise is to be distributed gratuitously. Mr. Sturtevant's methods have been rapidly adopted during the past few years by many manufacturing establishments, such as textile and wood-working factories, railroad and machine shops, foundries and the like. But the most complicated as well as the most satisfactory applications have been made in halls of audiences, such as legislative chambers, churches, schools and theaters. In these the method of ventilation is as vital as that of heating, a more complete distribution of the air is required, and in the best arranged system each occupant of the room is individually ventilated. To this end registers or openings are provided beneath each seat, the amphitheater form of many halls rendering such arrangement easy of introduction.

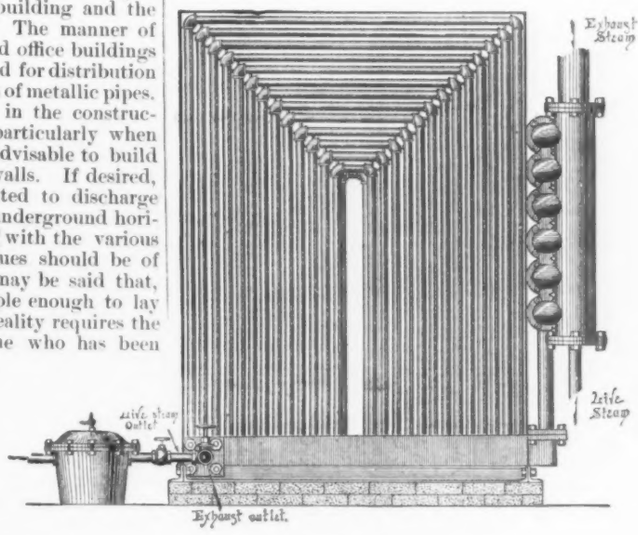


Fig. 2.—The Sturtevant Heater.

Westinghouse, Church, Kerr & Co., whose main office is at New York, have established a Western branch at 156 and 158 Lake street, Chicago, where they will conduct a general steam engineering business in connection with the sale of the Westinghouse engine and the Roney mechanical stoker and smokeless furnace. The Roney stoker is a device for securing uniform combustion of bituminous coal, is the invention of W. R. Roney, of Chicago, and has been introduced into a number of establishments, including manufactories and power stations for cable railways. Although it is comparatively new, the inventor has been very successful in introducing it in the Northwest, and Westinghouse, Church, Kerr & Co. propose to make its advantages known in a wider field. They intend in time to erect works at Chicago for the manufacture of the stoker, but have not yet determined upon their exact location. H. E. Longwell is the manager of the Chicago branch of the firm, and Carl M. Vail, of the New York office, has also been temporarily transferred to the new venture to assist in getting matters in good running order.

Resistances of Vestibuled Trains.

A correspondent of the *Railroad Gazette* writes, in a recent issue, of train resistances as affected by the vestibule attachment. From his letter we quote as follows:

As long ago, at least, as 1847 (Weale, London, 1847, and Glasgow Proc., Mech. Mag., Vol. 2, p. 204), in making experiments on atmospheric resistance, Henry Bessemer (who afterward invented the Bessemer process) from an ingenious apparatus arranged by him, found the front surface resistance of a car at 20 miles per hour 3.2 pounds per square foot, at 30 miles, 4.5 pounds; at 35 miles, 6.1 pounds; at 45 miles, 10 pounds. Each car added at 45 miles increased this resistance 4 pounds per square foot, the total being, for a train of three cars, 18 pounds, and for six cars, 30.5 pounds. The model train was then vestibuled car by car, and the result was the reduction of resistance in the same ratio of 4 pounds per square foot per car, the entire train, completely vestibuled, showing at 45 miles the face resistance of 10 pounds due to a single car. Of course, running at speed against a wind on the quarter, side resistance would be affected by length, but these evidently are increased by successive openings between the cars. With the improved apparatus now at command, dynagraph experiments on vestibules for ordinary trains, if they proximately verify Mr. Bessemer's results, may lead to important changes, and with these to some sensible way of preventing telescoping as it now occurs in collisions. Believing for myself that the continued use of timber frames, jointed at the floor, is behind the age of continuous metal frames, tubular or cellular, I think the field for improvement in this direction is large. In modern practice, on the Erie Canal, boats tow so much easier in *cue* that this is now the common practice, and when they can be also vestibuled wave resistance will be greatly reduced.

Messrs. John Wiley & Sons, the well-known book publishers, have just brought out a new catalogue (January, 1888) of text-books and industrial works. The interest attached to a catalogue of this kind is apparent, and we have no doubt that the pamphlet will prove a welcome guide to a large number of students.

The London *Engineer*, in a review of engineering progress during the year 1887, says among other things: "We cannot conclude our brief notice of the progress of marine engineering without alluding to the paradoxical, but none the less certainly true, results obtained by Mr. Kirkaldy, of East India road, with his apparatus for heating feed-water with live steam taken direct from the boiler. In theory, of course no advantage whatever in the shape of economy of fuel can be had in this way, for nothing more in the way of heat

can be returned to the boiler than comes out of it. But practice in this case, for some inexplicable reason, belies theory. Kirkaldy heaters have been fitted to the steamships Lisnacrieve, Saxmundham, Gleadowe and Yoxford. Messrs. Hunting and Pattison, the owners, are so well pleased with the results that they have also had another of these steamers, the R. F. Mathews, fitted. Weir's system has long been used by the Peninsula and Oriental Company. Steam is taken from the intermediate receiver, and used to heat the feed-water: the saving is found to be 8 per cent., but 4 per cent. is lost by not working the steam so drawn off through the low-pressure cylinder. Mr. Kirkaldy, however, takes it direct from the boiler and still effects a saving—why, will constitute a nice little puzzle for some time to come.

The Creusot Steel Works, France, are experimenting with an electrical steel melting furnace.

Southern Iron Freights.

The Southern Railway and Steamship Association have issued a circular establishing freight rates on the following articles, which took effect on the 23d ult.:

Bar; Band; Boiler; Sheet and Plate Iron or Steel, all unpacked; Roofing in boxes, rolls or bundles; Jail Plate; Pipe, wrought, released; Pipe, cast, released; Bolts, in kegs, casks or drums; Nuts in kegs, casks or drums; Rivets in kegs, casks or drums; Washers, in kegs, casks or drums; Wagon Tires; Castings, not machinery, each piece weighing 200 pounds or over, not packed, owner's risk of breakage; Car Wheels and Axles; Wagon and Carriage Axles; Wagon and Carriage Skeins and Boxes, packed in kegs, barrels or casks, released; Plow Plates; Plow Points; Plow Molds; Plow Wings; Plow Steel; Cut Nails and Spikes, in kegs; Fish Bars and Fastenings; Horse and Mule Shoes; Fence Wire; Mattocks and Picks, in bundles or barrels; Crow Bars; Fence Posts; Railroad Iron, L. C. L.; Bridge Iron, L. C. L.; Sad Irons, in barrels or casks, released; Sad Irons, in boxes, contents to be plainly marked on boxes, and contract to be made by shipper that no other articles than Sad Irons shall be put in the boxes; and Sash Weights, unpacked.

PER 100 POUNDS.

	Cotton ties, carloads.		Stoves & hollow ware, C. L.
	Pittsburgh, Pa.	Youngstown, Ohio.	Zanesville, O.
Albany, Ga.	..	..	81
Anniston, Ala.	32	30	62
Athens, Ga.	32	30	62
Atlanta, Ga.	32	30	62
Augusta, Ga.	32	30	53
Birmingham, Ala	35	33	49
Brunswick, Ga.	..	..	44
Cedartown, Ga.	32	30	62
Charleston, S. C.	..	..	44
Chattan'ga, Tenn	25½	23½	49
Columbus, Ga.	35	33	65
Dalton, Ga.	32	30	62
Eufaula, Ala.	35	33	65
Fernandina, Fla.	..	..	44
Fort Gaines, Ga.	..	..	72
Jacksonville, Fla	..	..	44
Macon, Ga.	32	30	65
Milledgeville, Ga	32	30	65
Montgomery, Ala	35	33	61
Port Royal, S. C.	..	..	44
Rome, Ga.	32	30	62
Savannah, Ga.	..	..	44
Selma, Ala.	35	33	61

The rate from Chattanooga and Birmingham to Memphis on the articles enumerated is 11½ cents per 100 pounds.

	Birmingham, Ala. Brierfield, Ala.	Chattanooga, Tenn.	Knoxville, Tenn.	Nashville, Tenn.	Columbus, Ky. Hickman, Ky.	Memphis, Tenn. Huntington, Miss. Vicksburg, Miss. New Orleans, La.	Louisville, Ky. Jeffersonville, Ind. Evansville, Ind. Cairo, Ill. East Cairo, Ky. Henderson, Ky. Paducah, Ky. Birds Point, Mo.
Anniston, Ala.	..	..	..	16	22	20	24
Athens, Ga.	18	17	20	20	23	21	25
Atlanta, Ga.	11	10	13	15	21	19	23
Augusta, Ga.	14	13	16	16	19	17	21
Birmingham, Ala	..	..	..	13	17	15	19
Brunswick, Ga	12	11	19	21	24	22	26
Cedartown, Ga	11	10	10	15	21	19	23
Charleston, S. C.	12	11	19	21	24	22	26
Chattanooga, Tenn.	11	..	7	7	13	11	15
Columbus, Ga	..	..	..	18	21	19	23
Dalton, Ga	11	7	7	15	21	19	23
Eufaula, Ala	..	..	..	18	21	19	23
Fernandina, Fla	12	11	19	21	24	22	26
Jacksonville, Fla	12	11	19	21	24	22	26
Macon, Ga	14	13	16	18	21	19	23
Milledgeville, Ga	18	17	20	18	21	19	23
Montgomery, Ala	..	9	12	12	16	14	18
Port Royal, S. C.	12	11	19	21	24	22	26
Rome, Ga.	11	10	10	15	21	19	23
Savannah, Ga.	12	11	19	21	24	22	26
Selma, Ala.	..	9	12	12	16	14	18

	Cincinnati, Ohio.	Boston, Mass.	New York, N. Y.	Philadelphia, Pa.	Baltimore, Md.	Richmond, Va. Norfolk, Va. Portsmouth, Va. Petersburg, Va. Lynchburg, Va.	Wilmington, N. C.	Charleston, S. C. Port Royal, S. C. Savaannah, Ga. Brunswick, Ga	Pittsburgh, Pa., C. L. McKeesport, Pa., Carload.
Anniston, Ala.	24	29	29	29	28	24	22	21	36
Athens, Ga.	25	29	29	29	28	23	21	20	37
Atlanta, Ga.	23	29	29	29	28	23	21	20	35
Augusta, Ga.	21	22	22	22	20	16	14	†13	31
Birmingham, Ala.	23	29	29	27	26	24	22	21	32
Brunswick, Ga.	26	..	..	..	..	16	..	..	31
Cedartown, Ga.	23	29	29	29	28	23	21	20	35
Charleston, S. C.	26	..	..	..	..	12	..	..	27
Chattanooga, Tenn	15	29	29	27	26	23	21	20	27
Columbus, Ga	26	..	..	..	..	..	..	..	36
Dalton, Ga.	23	29	29	29	28	23	21	20	35
Eufaula, Ala.	26	..	..	..	..	..	..	..	36
Fermandina, Fla	26	..	..	..	..	16	..	..	31
Jacksonville, Fla.	26	..	..	..	..	16	..	..	31
Macon, Ga.	23	29	29	29	27	23	21	19	35
Milledgeville, Ga.	23	29	29	29	27	23	21	†19	31
Montgomery, Ala.	21	29	29	27	26	23	21	20	31
Port Royal, S. C.	26	..	..	..	..	16	..	..	31
Rome, Ga.	23	29	29	29	28	23	21	20	38
Savannah, Ga.	26	..	..	..	..	16	..	..	31
Selema, Ala.	21	29	29	27	26	23	21	20	31

† Rates marked thus (†) do not apply from Brunswick, Ga.

The Baldwin Works have lately been equipped with the Westinghouse alternating system of electric lighting, and the officers are highly pleased with the results attained. As a great deal of work is being done at night, and as mechanical operations require good light, the system is receiving a severe test, but it is said successfully to meet all requiremedts. There are 2700 incandescent lights throughout the works. Exceptionally small power appears to be needed for keeping up the supply, and the lamps give no trouble whatever.

The Nashville Iron Company, of Nashville, Tenn., inform us that on their 8-inch mill, running single turn, they ran nine days without spoiling a piece of iron or making any cobbles, John Barton being the roller. They triumphantly add: "Beat the record."

The San Francisco Bridge Company, who lately made an assignment with liabilities of $400,000, have resumed business on an extension of time granted by the principal creditors, and will pay all claims in full.

Messrs. E. M. Blum & Co., Kemble Building, New York, announce that they have made arrangements with Mr. Antonio Cuyas, Jr., Spanish delegate of the Barcelona International Exhibition, to represent a number of manufacturers and take full charge of their exhibits.

The literature of the subject of liquid fuel burning is in one sense more extended than is suspected, and it would, perhaps, surprise some of our readers if they knew how thoroughly the ground had been traversed by inventors, and what a great number of devises for burning liquid fuel have been tried. There is really very little practical difficulty in burning this fuel. It is all a matter of expense and safety.

A Revolving and Tilting Mold for Casting Tubes.

As a preliminary step in the manufacture of copper and brass tubes, George Adams, of Ansonia, Conn., has devised a revolving and tilting mold, the features of which are shown in the accompanying engravings. The mold consists of a sill bearing two standards, one of which is shown on the right of the vertical section, Fig. 1. By bolts and slots these standards can be adjusted in hight. They bear a plate upon which is a longitudinal track for a truck carrying the pots of melted metal. The mold is revolved by the gearing shown. The mold is supported by the upper ring shown in the engraving, aided in some positions by the lower ring. Both have an annular groove in which rest anti-friction balls. The central trunnion ring, shown in Fig. 2, has two trunnions which rest in bearings in two diagonal arms. The core is made around the core barrel in the usual manner. It is supported by a lower core bit, and by an upper core bit, shown in section, just below the bowl, in Fig. 1, and in plan in Fig. 3, being a ring surrounding the core and provided with three thin radial arms, the outer diagonal ends of which rest on the annular diagonal interior surface of the upper part of the mold. The upper edges are protected against the action of the melted metal by plumbago. Attached to the left end of the sill, Fig. 1, is a ring, shown in plan in Fig. 4. That half of the sill ring which is on the left side of the diameter of Fig. 4 is detachable from the other part of the ring by simply lifting its fixed pins out of the corresponding pinholes in the other half.

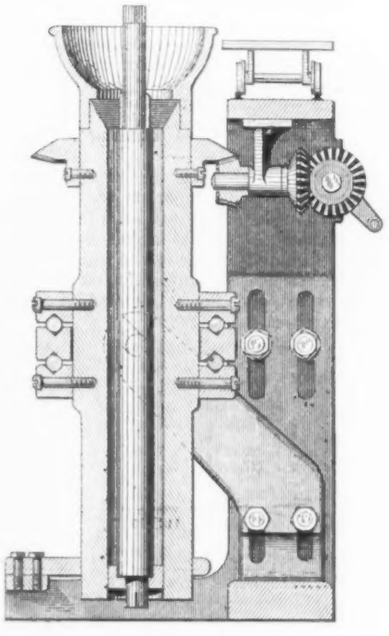


Fig. 1.—Vertical Section.

Fig. 2.—Trunnion Ring.

Fig. 3.—Upper Core Bit.

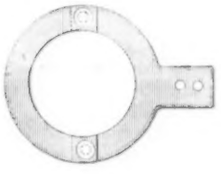


Fig. 4.—Sill Ring.

REVOLVING AND TILTING MOLD FOR CASTING TUBES.

The mode of operation is as follows: While the melted metal is being poured into the mold the mold is being revolved by the crank, and after the mold is filled and the tube cooled the removable half of the sill ring is lifted away, and the mold and its contents are tilted upon the trunnions to a horizontal position, and the tube is then conveniently removed by pulling it, with the core and upper core bit, out of the upper end of the mold. The revolution of the mold, while the melted metal is being poured into it, causes the tube to be built up spirally around the core, and thus produces a freedom from blow-holes and an excellence and uniformity in the casting which cannot be attained where the mold is stationary, and the metal is therefore first deposited on one side of the core and reaches the other sides by flowage alone, and that revolution also preserves the bowl and the mold from being burned through by the stream of melted metal falling or running constantly on one place in the interior thereof. The tilting of the mold enables the cooled tube to be withdrawn horizontally therefrom, and thus lessens the labor incident to the business.

The Iowa Railroad Question.

The most important and influential business convention, it is said, that ever assembled at the capital of Iowa met there on the 25th ult., under the name of the Shippers' Convention. It was composed of over 100 representatives of the Board of Trade, shippers, jobbers and manufacturers of the principal cities of the State, who assembled to formulate their views in relation to the legislation needed to relieve shippers from the burdens of discrimination and excessive freight rates. The following were chosen permanent officers: President, Samuel Mahon, of Ottumwa; secretary, F. W. Letts, of Marshalltown; treasurer, J. T. Stewart; executive committe, N. S. Ketchum, Marshalltown; Carl Leopold, Burlington; E. H. Merriam, Council Bluffs; F. W. Smith, Davenport; George C. Baker, Des Moines. A committee on resolutions of 12 members was appointed; Robert Donahue, Burlington, chairman.

By request the Hon. L. S. Coffin, Railway Commissioner, addressed the convention briefly, illustrating by maps the evolution of trade and manufacturing centers in Iowa, and setting forth the needs of regulation of transportation lines to diversify and protect the industries of the State. The Hon. J. Kennedy, president of the Farmers' Alliance, said the interests of the farmers, shippers and manufacturers were identical. The farmers ask no class legislation. A resolution was passed inviting the railroad committees of the General Assembly to attend the convention and take part in its discussion. At the evening session Governor Larrabee, the railroad committees and many other members were present.

The Committee on Resolutions submitted two reports, the majority favoring the bill introduced by Representative Cummins, with certain modifications intended to close up the loopholes apparent in the first draft of the bill. The measure provides that the Railroad Commissioners shall have power, and it shall be their duty, to fix, determine and publish the charge to be made by all railroad companies doing business in that State for transportation of freight or passengers. This may be upon their own motion or upon hearing of complaints of discrimination or excessive charges. In determining what is a reasonable rate the board shall take into consideration the rate charged by the company for carrying freight and passengers from beyond the State to points within the State, and shall also take into consideration the rate established for substantially similar or greater service by the same company. The bill provides for stringent penalties for violation of its provisions.

The Hon. Merritt Green, of Marshalltown, on behalf of the minority, submitted a report favoring the measure proposed by the Marshalltown shippers. It enacts directly that no greater rate per mile shall be charged for transportation by Iowa lines than is charged from any point in Iowa to any point on said lines out of Iowa, or from any point out of Iowa to any point in that State. And such rate shall be declared a reasonable rate. The proposed bill allows for reasonable terminal charges, and provides that the Railroad Commissioners shall enforce its provisions. The two reports were not essentially different, but a spirited discussion followed their presentation. The minority finally withdrew their report and accepted the majority report after slight modification. It was then unanimously adopted. The convention also declared against the proposed plan of electing railroad commissioners, and favored the present method of appointment by the Governor, with the addition that they be confirmed by the Senate.

We have received, through W. E. Stockton, 16 West Lake street, Chicago, Western agent for the Moorhead-McCleane Company, a copy of their calendar for 1888. It is of large size, intended for hanging on the wall. The most conspicuous feature of this calendar is a representation in miniature of a sheet of galvanized iron, with the company's well-known trade-mark and descriptive marks reproduced on it in the exact style adopted in their regular business. The imitation is very cleverly done and will attract attention. It occupies the center of the card, the monthly calendar being arranged in columns on each side of it.

E. C. Potter, vice-president of the North Chicago Rolling Mill Company, Chicago, has received from Managing Director Greiner, of the Société Cockerill, Seraing, Belgium, a handsome nickel-plated section of Sangberg's Goliath rail. This rail weighs 115 pounds per yard and is used by the Belgian State railroads. As compared with it, a section of the 70-pound rail now used on the leading railroads of this country is but a pigmy, and even the new 90-pound rail of the Pennsylvania Railroad Company seems of but slight proportions.

Cable despatches announce the death at Guise, France, of M. Godin, famous as the one who has established the most successful co-operative industrial enterprise on a grand scale.

Coal and Coke Development in Alabama.

The prospective large extension of the pig iron industry in the Birmingham, Ala., district during the year 1888 is attracting more than passing attention to the fuel situation. Both coke and coal have been scarce throughout that region for the last six months, and if the output should not be increased considerably it would be a problem how the 15 furnaces under way about Birmingham and at Sheffield might be supplied with fuel, and, as it is, it is an interesting question what increase of product they will presently bring about. The work actually under way or laid out is sufficient to relieve any serious apprehension as to quantity of fuel. What will be the efficiency of some of the new projects though and whether they will pay living profits or not remains to be seen; and the outlook is very promising for new-comers of experience, judgment and capital.

The Tennessee Coal, Iron and Railroad Company, who are the largest producers of fuels, as well as of iron, in the South, are constantly extending their operations at the Pratt Mines, where all the physical conditions are very well known and new openings correspondingly easy. From about 2500 tons a year ago and 3000 at present, their possible daily output will probably be increased to 4000 tons in the next six months and another thousand by the spring of 1889.

The De Bardeleben Coal and Iron Company will be almost as large an operator before a great while. Their first half-dozen openings were unfortunately located and have been abandoned, but others have been successfully driven—one to a depth of 1200 feet—promising some 500 tons of coal a day by the last of March, when it is expected one of the company's two furnaces will be ready to go into blast. All this is within 20 miles of Birmingham. About twice as far, in the untouched field of Murphree's Valley, which is very rich in both coal and iron, they are locating a number of mines with a view to very extensive operations. The Bessemer and Sheffield Coal and Coke Company, made up largely of the same people as the De Bardeleben company, are opening four slopes some 25 miles from Birmingham, from which about 1200 tons are expected. The chief mining engineers of the two concerns say that in two years, according to their present plans, they will be able to take out 5000 tons a day, if they care to.

The Sloss Iron and Steel Company have openings in progress near Coalburg that will increase their output from 800 to 1800 tons. The Alabama-Connellsville Coal and Coke Company, a new concern, neighbors to the De Bardeleben, will be able to mine 500 tons a year from now if their present projects turn out fairly. Their property is the most remarkable in the district in size of deposit. The vein is 11 feet thick, and has but one parting. The dip, however, is such as to make mining more difficult than elsewhere in the district. A considerable coal interest will be developed during the year in the West, Warrior field, mainly in Walker County, but how this will affect the iron industry is as yet largely a matter of conjecture, no satisfactory smelting coke having been made from any of the coals of this region. In the opinion of some of the best-informed operators in the district, however, certain of these coals, which are among the dryest bituminous fuels in the country, can be used in the furnace in the native state—anyhow with coke, half and half.

The development is even better assured in coke than in coal. The Tennessee Coal, Iron and Railroad Company have 140 ovens recently completed, and 350 more under way, which will give them 800 in all. The Sloss Company are building 80 Thomas ovens, which are estimated to be equal to 240 bee-hive ovens. The De Bardeleben Company have 150 ovens under way, and will build as many more as soon as these are completed. The Eureka Company, who have bought the Helena property of the Tennessee Coal, Iron and Railroad Company, purpose duplicating the coking plant of 100 ovens. The Cahaba Coal and Mining Company, who, like the Helena property, are in the Cahaba field, have made a beginning on 400 ovens, mainly to supply the Woodstock furnaces, in and near Anniston, and the Pioneer furnace near Birmingham. The Woodstock Coal and Iron Company recently bought an interest in the Cahaba concern. The Pioneer Mfg. Company's contract runs for only one year from the completion of their furnaces, after which period it is expected they will make their own fuel somewhere on their coal property, which is quite extensive.

The Sheffield people seem to believe in the qualities of the West Warrior coal for iron-making. The Alabama and Tennessee Coal and Iron Company have broken ground for 300 ovens at Jasper, Walker County. Several coal operators in the same county have contributed to build six experimental ovens at the same place, after the patent of Mr. Koener, who is superintending the construction, and on the general plan of the Coppée oven. Altogether, it would appear that at the close of the year 1888 the growth of the coal and coke industries in Alabama will be an important field for the economical statistician.

A Railroad Trust.

The Chicago *Tribune* for January 26 contained in its department of railroad news the following highly sensational statement:

The railroads of this country, finding that under the Interstate Commerce law they can no longer charge outrageously high rates and discriminate in favor of certain interests and localities, are now quietly moving to destroy the good effects of the law by bringing about the formation of a gigantic "railroad trust," or, in other words, virtually consolidating all the roads in the country and have them managed by independent officers to whom the officers of the various companies must report, and whose mandates and instructions will have to be obeyed. By doing this, it is claimed, the competition between the various railroads will be stopped and high rates can be maintained. Under the existing condition of affairs, it is claimed, some of the best railroad properties are being gradually forced to the wall in the unremunerative struggle for business. A circular has just made its appearance which appeals to the executive heads of railroad corporations to give the subject their prompt and earnest attention, as the traffic officers under their direction will not help in a solution of the difficulty, because it would tend to lessen the importance of their positions. They would not have the command of so large an army of traveling or other special and outside agents, there would be less need of expensive city offices, advertising would be materially cut down, and ticket commissions, freight rebates, and fast freight lines would be things of the past. Their office forces would be naturally reduced, and thus the duties of the traffic manager, general freight agent and general passenger agent would become little more than mere office routine. All of the trunk lines, the circular goes on to say, either singly or jointly, have to maintain expensive terminals in the operation themselves or by the payment of various classes of rentals, and many of the executive officers who are not given to close calculations would be surprised to know that on competitive business after payments for advertising, commissions and rebates expenses and charges of outside offices and terminals, so narrow a margin of the revenue is left as not to come anywhere near for the actual cost of transportation. The author of the circular believes a solution of the difficulty will be found in the formation of a railroad trust, or, as he expresses it in order to remove the odium of the proposition, a "railroad clearing-house." The feasibility of the plan, it is claimed, has been admitted by Commissioners Fink and Blanchard and other prominent railroad managers. The main object of the "clearing-house" or trust system, the circular says, would be in providing means for the maintenance of uniform and remunerative rates between competing points, and this could only be accomplished by taking out of the hands of railroads the power to make their own rates. The "clearing-house" or trust, it is suggested, should be chartered and capitalized to a sufficient extent to insure absolute safety and security to the railroads whose immense competitive business would be placed in its hands for settlement between the roads, its operation to be conducted by a president, secretary and treasurer, and such other officers as the "Clearing-house" Committee might find necessary.

Anthracite Coal Tonnage.

Anthracite coal tonnage for month of December, 1887, compared with same period last year, is reported as follows by John H. Jones, official accountant, the statement including the entire production of anthracite coal, excepting that consumed by employees, and for steam and heating purposes about the mines:

	December, 1887.	December, 1886.		Difference.
Phila. and Reading	618,305	544,675	I.	73,630
Central of N.J.	382,446	458,355	D.	75,909
Lehigh Valley.	356,647	596,919	D.	240,272
Del., Lack. and W.	725,685	477,634	I.	248,051
Del. and Hud. Canal Co....	417,701	263,833	I.	153,868
Pennsylvania R.R.....	351,213	288,559	I.	62,654
Penn. Coal Co.	151,734	110,975	I.	40,759
N. Y., L. E. & W.....	64,347	70,490	D.	6,053
Totals.....	3,068,078	2,811,350	I.	256,728
	For year 1887.	For year 1886.		Difference.
Phila. and Reading....	7,555,252	6,695,731	I.	859,520
Central of N. J.	4,852,859	4,964,752	D.	141,893
Lehigh Valley.	5,784,450	6,184,466	D.	400,006
Del., Lack. and W.....	6,220,798	5,172,028	I.	1,048,770
Del. and Hud. Canal Co. ..	4,048,230	3,480,687	I.	567,543
Pennsylvania R.R	3,816,143	3,478,885	I.	337,258
Penn. Coal Co.	1,603,456	1,398,179	I.	205,277
N. Y., L. E. & W.....	759 834	731,649	I.	28,185
Totals.....	34,641,017	32,136,362	I.	2,504,655

The stock of coal on hand at tide-water shipping points, December 31, 1887, was 130,977 tons; on November 30, 112,103 tons; increase, 18,874 tons. The amount on hand December 31, 1886, was 372,282 tons.

Basswood may be enormously compressed, after which it may be steamed and expanded to its original volume. Advantage has been taken of this principle in the manufacture of certain kinds of moldings. The portions of the wood to be left in relief are first compressed or pushed down by suitable dies below the general level of the board, then the board is planed down to a level surface, and afterward steamed. The compressed portions of the board are expanded by the steam so that they stand out in relief.

The widely noticed Eiffel tower on the Champ de Mars, at Paris, has now been completed up to a hight of about 180 feet, or one-fifth of the total that it is intended to be.

The Tin Deposits of Dakota.

Attention is again called to the American tin question by the organization at Chicago, on the 5th ult., of the Consolidated Tin Mining and Milling Company, to work a tin mine in Dakota. This is the second company that has been formed at Chicago within a year for the purpose of developing the tin mines of the territory, the first being the Tin Mountain Company, composed of representative citizens, whose operations have so far advanced that their works are now completed and producing concentrates at the mines, which will be shipped to Chicago and smelted there. Both of these companies were organized after thorough and intelligent examination by competent mineralogists of the nature and extent of the deposits which it was proposed to work, and not merely upon assays of mineral of doubtful origin offered by mining adventurers. So much mystery has surrounded the operations of the original investors in Dakota tin mines, and so general is the belief that the tin of that region is a myth, that we are pleased to have the opportunity to lay before our readers authentic information on the subject, which has been placed at our disposal by two gentlemen who have recently visited the Dakota tin deposits for the express purpose of investigating their extent and the progress made in developing them. One of these gentlemen is F. H. Long, a practical chemist and mineral expert, and the other is S. A. Richards, who is a well-known iron manufacturer and metallurgist, both of them now residing in Chicago. They visited the tin district in December last, and are enthusiastic in their reports concerning it.

Messrs. Long and Richards state that the district is rich in tin ore, extending into parts of three counties, Lawrence, Pennington and Custer, and covering a large part of the region known as the Black Hills. The ore is found principally in mica schist, and can easily be mined or quarried. Some difficulty had been experienced by those who first attempted to work the tin mines in separating the ore from the mica, because ordinary stamps or rolls were used, and these became clogged up or were broken by the mica. Now, however, the treatment followed is to crush the ore to the size of a nut, pass it through cyclone pulverizers, in which it is reduced to dust, then separate it by passing it through fine screens. From the screens it goes to tubs, in which for the first time it comes in contact with water, although that which passes through the finest screen is clean tin ore, and needs no further treatment, but smelting. The mixture in the tubs is mechanically agitated, the greater part of the ore sinking to the bottom, whence it is taken out for smelting after the water is drawn off. The water contains in suspension, and in connection with the mica more tin ore which is further manipulated in a similar manner until nothing is left but the mica and quartz tailings.

A deposit in Warren Gulch, 6 miles west of Custer City, was most thoroughly examined and is specifically described as a typical load. This consists of a mass of ore from the sides of which the earth has eroded, leaving the formation exposed, standing from 10 to 20 feet above the ground, extending 2400 feet in length and averaging 35 feet in width, being of irregular shape. Its general appearance is that of a dyke. Assays were made upon the spot from selected ores and the results varied from 25 to 40 per cent. of metallic tin. A careful sampling was then made to secure a general average, and the result showed 14½ per cent. of metallic tin. From this particular deposit the ore can be quarried and run by cars on an inclined plane to a mill site below, it being estimated that 200,000 tons of ore could be taken from this one deposit without the use of any hoisting machinery. There are other deposits in the district of similar formation, but most of them are less accessible than this, and hoisting machinery will have to be used in mining, but the quantity of ore is great beyond dispute. Enough samples of ore and specimens of tin have been brought to Chicago and placed on exhibition there by Messrs. Long and Richards to convince the most incredulous that American tin is not a fiction but an indisputable fact. The quality of the ore is better than that of Cornwall, as upon analysis it proves to be free from tungsten, bismuth, arsenic and titanium. A small per cent. of silver is, however, found with it, not enough to pay for extracting, but enough, it is claimed, to give the tin a peculiarly bright luster. The operations of the Harney Peak Tin Mining, Milling and Mfg. Company have in the past had such an important influence on public opinion relative to the value of Dakota tin deposits that some reference must be made to them in this connection. Notwithstanding the reports that the investigations made by this company had been attended with unsatisfactory results, they have within the past two years been gradually but quietly seeking to gain the control of all the most valuable tin lodes in the Black Hills. They now own over 200 tin lode and placer claims, with water rights, and have bonded over 100 more. Within the past month they paid $40,000 for one group of claims. Altogether up to the present time they are known to have expended over $1,000,000 in acquiring mining property. On such claims as it is necessary they are paying the annual assessment of $100 to the Government, which amounted to a large sum of money last year. These actions by the Harney Peak Company give rise to the suspicion among miners that the condemnation of

THE TIN DEPOSITS OF DAKOTA.

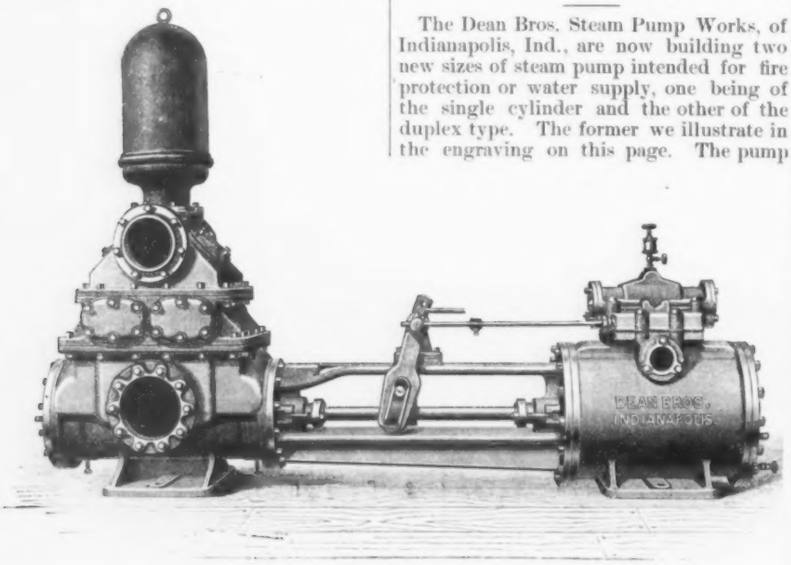
he Etta mine and the shutting down of the works there, which cast such a gloom over the prospects of the owners of tin claims, were but part of a comprehensive scheme to depress the value of such claims, to discourage attempts of other capitalists to develop the tin resources of the district and to enable the control of the most valuable mines to be secured in their own interest. They have been most savagely assailed in the English financial papers, and the attacks on their so-called chimerical schemes have been reprinted on this side of the Atlantic, but it is worthy of note that the company are not appealing to the public to purchase their stock. They evidently have an abundance of capital, and their managers know what they are doing better than the critical outsiders.

It is a matter of congratulation, we take it, that one large company is not being permitted to absorb all the tin mines of the Black Hills. Besides the two Chicago companies above mentioned, there is another called the American Tin Company, owning a property in Lawrence County, Dakota, which is composed of New York capitalists. A company of English capitalists have also made investments near Hill City, but if they have adopted a name it is not known. With the publicity which has lately been given to this matter, and the interest which is springing up in regard to the Dakota tin deposits, as well as the present very high price of tin, fresh activity has been infused into the seekers after tin lodes in the district, and new discoveries are almost daily being made. Chicago has been specially active in the work of practical development, and that city expects to reap important advantages when the tin industry of the Black Hills takes its place among our national achievements.

The works for the public supply of compressed air to Birmingham, England, have been pushed forward vigorously during the year 1887. The present contracts for engine power are for three triple expansion engines, each of 1000 horse-power. We learn from English papers that the buildings for this installation and for a further 1000 horse-power are completed, and the engines are in course of erection. The steam boilers are erected for six engines, as are also the gas producers, by which the steam is generated. The mains for distributing the compressed air from the central station are being laid through the town, the largest size being 24 inches in diameter, which is now being laid, together with others of 20 inches and 18 inches in diameter. They are wrought iron, and jointed by what is known as the "Kimberley" joint. They are laid in either concrete or brick trenches.

New Dean Pump.

The Dean Bros. Steam Pump Works, of Indianapolis, Ind., are now building two new sizes of steam pump intended for fire protection or water supply, one being of the single cylinder and the other of the duplex type. The former we illustrate in the engraving on this page. The pump



NEW SINGLE CYLINDER PUMP FOR FIRE PROTECTION OR WATER SUPPLY.

has a double-acting water cylinder and is provided with a noiseless steam-valve gear. The stroke is adjustable, even when the pump is running. The slide-valve has a continous motion like that derived from an eccentric. The water cylinder is of a double cap pattern, has large hand-holes for access to the valves, and has a large area of ports and valve passages. The parts are all extra heavy, so that it can be operated at a high speed under heavy pressure in case of fire.

The duplex steam pump is of the regular type; but it is carefully finished, of handsome design, and made for heavy fire service. The levers are wrought-iron forgings and the links are of brass. The frame is made in straight lines to prevent springing, and the different parts are so made as to be accessible. The parts subject to wear can be replaced without special fitting.

Goodwin and How's Foundry Ladle.

An automatic and very simple means of skimming the metal is provided in the foundry ladle illustrated in a recent issue of *Engineering*. The main body of the ladle is cylindrical (Fig. 2), but it is extended one side to form a spout by which the metal is poured. The communication between the ladle and the spout is made near the bottom, so that the metal which flows over the lip is drawn from the bottom of the general mass. The scoriæ and sand float on the top of the metal and are entirely prevented from escaping into the molds, which contain nothing but clean iron. The division or skimmer plate, between the ladle and the spout, is readily removable, and is provided with efficient means for holding the refractory lining. The ladle has been adopted by Messrs. Handyside, the Horseley Company, Tangye's, Limited; the Phœnix Foundry, the Grange Iron Company, the London, Brighton and South Coast Railway Company (locomotive department), Ransomes and Rapier, Dübs & Co., the Steel Company of Scotland, and many other leading firms. It is made by Messrs. Goodwin & How, 2 Victoria Mansions, Westminster.

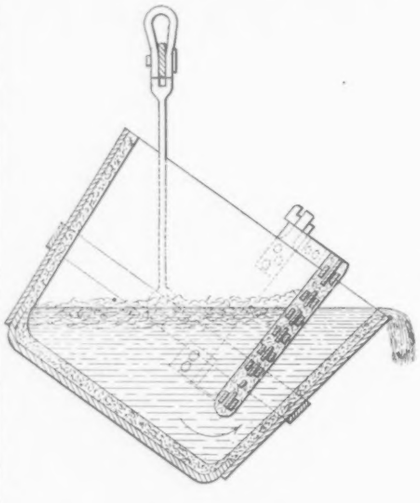


Fig. 1.—Section.

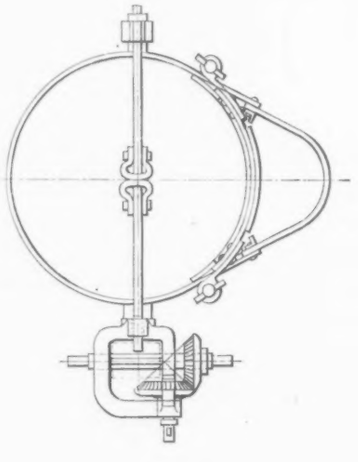


Fig. 2.—Plan.

GOODWIN & HOW'S FOUNDRY LADLE.

The Ohio Stamping and Tin Company, with a capital stock of $40,000, has been incorporated at Bellaire, Ohio. The company will go to work at once, and hope to be manufacturing novelty tin goods in a couple of months.

The Sandusky, Ohio, Improvement Company, backed by $1,500,000 of Eastern capital, have secured 750 acres of land in the western portion of the city and have agreed to put up the following establishments: One engine and boiler or machine works, with capacity for employing 400 persons, estimated cost, $150,000; one glassware or iron works, with capacity for employing 500 persons, estimated cost, $140,000; one chair works, with capacity for employing 150 persons, estimated cost, $125,000; one glass-bottle works, with capacity for employing 150 persons, estimated cost, $75,000; one window-glass works, with capacity for employing 50 persons, estimated cost, $50,000; street improvements, water mains and street-car lines, estimated cost, $50,000; natural gas pipe line from the Northwestern Ohio gas fields, estimated cost, $900,000.

A New Friction Clutch.

Messrs. Jones & Rogers, of Cincinnati, Ohio, are the makers of a new form of friction clutch, which is both simple and effective. The engravings which we annex fully explain its arrangement and manner of working, and make a detailed description unnecessary. It will be noticed that the complication of levers, set screws, springs, &c., frequently employed is avoided, a plain cast-iron split friction ring and key only being used. The ring fits inside the bored-out portion of the pulley hub, and can be expanded by the key or wedge on the shaft so as to effect a tight grip. The key is operated through a lever, as shown in Fig. 1. The simplicity of the device is at once apparent.

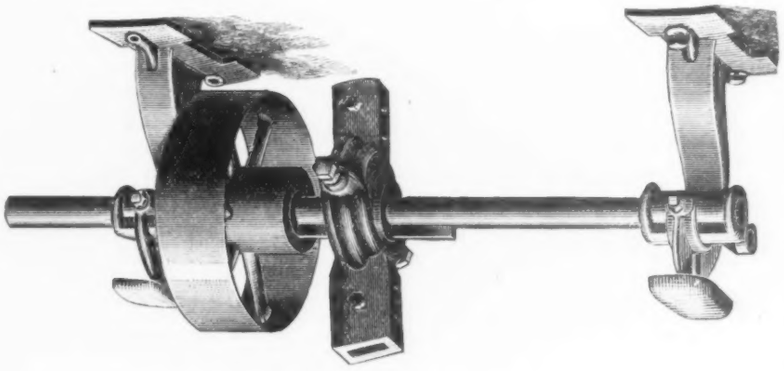


Fig. 1.—General View.

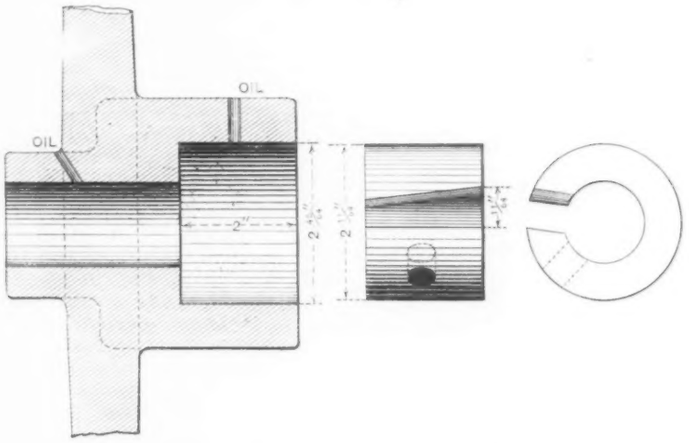


Fig. 2.—Section of Pulley Hub and Views of Friction Ring.

FRICTION CLUTCH, MADE BY JONES & ROGERS, CINCINNATI, OHIO.

Recent Treasury Decisions.

The following decisions made during December have just been published by the Treasury Department:

Materials for International Bridge.—On the 2d of December, I. H. Maynard, Assistant Secretary, addressed a letter to the Collector of Customs, at Marquette, Mich., referring to the use of foreign materials in the construction of the International Bridge at Sault Ste. Marie. The decision is made that only such of the foreign materials as are actually used on the United States shore are dutiable, but that the foreign materials used in the construction of the bridge on the river up to the shore end may be exempt from duty.

Drawback Allowance on Exported Tin Plate Scrap.—On the 8th of December, the Assistant Secretary addressed a letterto Adolph Kern, 108 Grand street, New York, instructing him that there is no provision of law to authorize an allowance of drawback on the exportation of scrap or wastage resulting from the conversion of any imported materials into manufactured articles. In this case, allowance was asked on tin plate scrap resulting from the manufacture of imported plate into various articles.

Steel Circular Saw Plates.—In the case of the appeal of W. F. Wagner from an assessment of duty at the rate of 3 cents per pound on steel circular-saw plates, imported May 16, and returned by the New York appraiser as valued over 7 cents per pound, the Assistant Secretary holds that while the steel plates in question are of octagon shape, varying from 18½ to 28½ inches in diameter, they should not be entered as sheared shapes of plate steel, but as steel circular saw plates. He therefore affirms the assessment of duty by the appraiser.

Granulated Pig Lead.—In the decision rendered in the case of William Paulsen, appealing from an assessment of duty at the rate of 2 cents per pound on so-called "granulated lead," the decision is made that since by analysis the articles are shown to contain from 99.18 to 88.38 per cent. of metallic lead, it must come under the provision of the clause covering lead in pigs and bars, molten and old refuse lead run into blocks and bars, and old scrap lead fit only to be manufactured. The assessment of duty is affirmed.

Garden Shears.—In the appeals of Baker & Hamilton and of J. Caire a duty of 45 per cent. ad valorem was assessed on garden shears imported into San Francisco. The appellants claim them to be dutiable at the rate of 35 per cent. ad valorem, under the provision in schedule C for cutlery. The Treasury department following the ruling of the Simmons Hardware Company *vs.* Lancaster, in which sheep shears were held to be included within the meaning of the word "cutlery," decided that garden shears are dutiable at the rate of 35 per cent. ad valorem, as cutlery.

Assessment of Duty on Merchandise bought and sold by the Ton.—Naylor & Co. entered two invoices of steel rods, one covering 757 bundles, on which duties were exacted, while the other covered 6252 bundles, where the weigher's returns showed a deficieny of 7765 pounds, for which no allowance was made in the assessment of duties. The importers claim that the merchandise in question is bought and paid for, not according to the weight specified in the invoice, but according to the weight which may be found and returned by the United States weigher when the goods are entered at the Custom House. The Treasury Department holds that where it satisfactorily appears that only the number of pounds or tons of the specified merchandise imported which is shown to have been entered or landed is to be paid for at a given price per pound or ton, such price is the unit of value to which the statute refers, and the appraised value cannot be reduced below that sum; but, if it appears that a lump sum is to be paid for the merchandise specified in the invoice, without regard to the precise number of pounds or tons landed, then the invoice or entered value per pound or ton would be ascertained by dividing the value of the entire invoice by the quantity shown by the weigher's return, and the appraised value could not properly be reduced below such sum.

Profit Sharing at Springfield.

On Saturday, January 28, the Springfield Foundry Company, of Springfield, Mass., gave a dinner to their employees at the Blackman House, the occasion being the announcement of the result of the first year's trial of the profit-sharing system, introduced by the managers, Edward W. Seeger, treasurer, and William A. Harris, secretary of the company. The dividend, as fixed by the directors, will amount to 2½ per cent. on wages for the year. Those who have entered the service of the company since April 1 do not participate in the dividend this year. Dividends will be payable at the company's office February 1. Any who wish may leave the money with the company at 5 per cent. interest, taking a certificate of the amount. The company say in a circular which was distributed among the employees Saturday night:

While our business has been fairly successful during the past year it cannot be said that profit sharing has produced any marked change of results in dollars and cents. We hardly expected it the first year. Yet we take pleasure in saying that most of the men have showed that they appreciated the profit-sharing plan, and have tried honestly and heartily to do well. Some, no doubt, have partly forgotten our offer of last year, or have not fully realized its bearing and importance. Others have been careless and made imperfect castings, fit only for scrap iron. Such castings constitute the worse "leak" in all foundries. We believe our average in this respect is as good as that of other foundries doing similar work, perhaps better, yet our net loss on bad castings the past year has been fully twice the amout of the dividend we are about to pay you! More than half this loss is due entirely to carelessness, for which there is no excuse. Sometimes it is the core-maker who is careless, but oftener it is the molder. Perhaps lack of skill or judgment causes the rest of the loss. This lack can be remedied by careful study and attention.

This year the record must be greatly improved. You might much better put the money in your pockets in the shape of dividends than throw it away on imperfect work. It may surprise you to know it, but it is nevertheless true, that our average loss per pound on bad castings—day work—is over seven times the average profit on good castings! Even on piecework we lose five times as much on an imperfect casting as we gain on a good one! In other words, when you lose a casting which requires one hour to mold it takes you all the rest of the day to make good castings enough to cover the loss! Not much profit-sharing on such a day's work! We want you to bear this in mind. It shows you how close the margin is in this business and how it hurts yourselves as well as the company when castings have to be condemned and remelted. We desire to impress upon you the importance of these matters and also the necessity of saving in little things. Let nothing be wasted! There's not a man in our employ who cannot prevent waste in many ways. Do not forget it.

We propose to try another year of profit sharing and we depend upon all hands to join with us in making it a great success. The second year ought to show very tangible results, and prove that profit sharing is worth continuing and a benefit to both employers and employed. We believe in it and shall be disappointed indeed if it does not succeed with us as it has done with so many others. Many are looking with interest at our experiment; some do not favor it, others condemn the whole idea. If you believe it a good thing show it by your conduct and work this year.

The United States National Armory, at Springfield, Mass. is now rolling daily hollow steel molds or ingots (made in Pennsylvania) for their gun-barrels, at one heat, rapidly, and perfect in soundness, quality, finish, &c., and these steel cylindrical tubes are in reality weldless tubing

THE WEEK.

While plumbers were at work thawing out gas-pipes in the basement of a five-story tenement on Tenth avenue last Friday evening, the flame of their lamp is supposed to have ignited two barrels of kerosene, which exploded, and the entire building was quickly filled with smoke and flame. In the hight of the excitement Fireman Price, by means of a rope dropped over the projecting cornice, rescued a stout woman from an upper story window, displaying a heroism that elicited voriferous cheers from the crowds of spectators.

The efficiency of the Steamboat Inspection Service is severely called in question, and it is charged that reorganization is imperatively demanded, as under the present system few men practically qualified for their work are chosen to fill the offices. The new York local board is made up of two inspectors and 12 assistants, with their clerks, who are equally divided in the respective duties of examining hulls and equipments, engines and boilers. It is claimed that the appointees should be either engineers or practical navigators in order to discriminate in granting licenses, whereas some of the incumbents are wholly lacking, so it is charged, in these special qualifications. These allegations are too serious to be regarded with indifference.

The sugar pool formed in this city recently to control the market has closed four refineries, and is enabled to buy the raw product from importers at the lowest price. An instance of this power occurred on Saturday, when a cargo of 2100 tons of raw Manila arrived in port from the East Indies, and was disposed of in the usual way. There was just one bid for this sugar—4¼ cents a pound. On January 6 a cargo, almost a duplicate of this one, was sold at the rate of 4⅜ cents a pound. A comparison of the two transactions shows a decrease in price of the refiners' raw material of ⅛ cent a pound, on a good-sized cargo of 2000 tons—a matter of $15,000 or thereabout. Meanwhile refined sugars, which sold under 6 cents per pound, have advanced to 7¼ cents to 8¼ cents, according to description. From these data it would appear that the trust will realize from this single cargo, after it shall have passed through the refining process, upward of $100,000, compared with profit from like transactions under free competition. The president of the new corporation is Harry O. Havemeyer; secretary and treasurer, J. H. Searles. Already a great rival sugar refinery is talked of in Philadelphia, and refineries in the Dominion may have a chance.

Of all implements in use the champion tool for some days past is the snow shovel. It has been plied vigorously on thousands of miles of railroad track, and scores of cities have been excavated.

The National Jobbers' Association of Plumbers', Gas and Steam Fitters' Supplies is the name of a new organization formed last week in Pittsburgh for the promotion of amicable relations. A scale of prices was agreed upon. John Walker, of Detroit, was elected president.

A $7,000,000 raid upon the United States Treasury is being pushed by a delegation representing the great water routes of transportation between Buffalo and Duluth. The most important works for which this vast sum is asked are the strengthening and deepening of the channel of the Detroit River, the dredging of the lakes between St. Clair and Huron, the dredging of Hog Lake Channel in the St. Marys River, connecting lakes Huron and St. Clair, and the enlargement of the locks of the great ship canal at Sault Ste. Marie. According to a recent report by the War Department, more vessels pass through this canal in a given month during the season of navigation than enter the port of Liverpool. For the month of August, 1887, the average number of vessels per day passing through the canal was 57, and it is estimated that should the present rate of increase be continued during the next two years the ultimate capacity of the canal, which is 96 vessels per day, or one vessel every 15 minutes during the 24 hours, will have been reached. These facts constitute the main argument upon which the friends of the $7,000,000 bill rely.

One of the largest Cuban sugar manufacturers is about to build a factory of brick, iron and stone, at Key West, to cost $200,000.

The Mexican Central branch lines of railway will be completed to Guadalajara in May, and to San Louis Potosi in August. Gradually all important points in Northern Mexico are being brought in communication with the United States railway system.

The Standard Oil Company have commenced building large oil tanks at Duluth, and promise to supply the entire West and Pacific Slope from that point. Vessels expressly fitted for oil transportation will be employed on the lakes.

Three Japanese manufacturers are making a tour through several Western cities "to see new things."

A formidable strike among the young women employed in the Clark Thread Mills, at Kearney, N. J., was adjusted through the friendly interposition of Father O'Connor, with whose parish many of them are connected. The obnoxious superintendent, whose alleged arbitrary conduct was the cause of the trouble, will be retained, but he will be more circumspect hereafter in enforcing discipline.

The temptation to profuse expenditure caused by abundant money in the public treasury is illustrated by the facts that bills already presented in the United States Senate provide for the expenditure of about $13,000,000 for public buildings, and bills of like character in the House propose to expend in the aggregate about $15,000,000, the amounts varying from $50,000 to $2,000,000.

The starting of the cable cars at St. Paul on Friday was attended by a fatal accident. The grip lost its hold while a train was passing a curve and a passenger car was derailed with fearful violence, causing the death of M. L. Saunders, assistant treasurer of the Northwestern Fuel Company, and the maiming of a dozen others, one of whom was burned by the car stove.

John Dunham, mechanical engineer, died at his residence in this city January 26, aged 68 years. During the war he superintended the building of five ironclad monitors. He built the Kamscatka for the Russian Government, and the Confucius, the first side-wheel beam-engine boat sent to China. He also built the caisson and gates of the Brooklyn Navy Yard dry-dock and the piers of the Harlem Bridge. He was a director of the World's Fair held in 1854, and was for 15 years engineer-in-chief of the Board of Education.

The Russian Minister of Finance declares that the heavy loan which the Government desires to negotiate will be devoted exclusively to railway construction, with the object of developing Russian industries.

The committees representing the City Council, the Merchants' Exchange and the railroads centering in Buffalo have come to a final understanding about grade crossings. Several of the streets will be put under the railroad tracks and three streets will be carried over. A union depot is provided for in the plan. It is to have a frontage of 300 feet and will be seven stories high. The estimated cost of this depot complete is $700,000. The whole work will cost $2,000,000 or $3,000,000.

Out of 1107 steamers which last year left New York carrying grain for Europe only one was an American ship. And out of 74 sailing vessels only one bore our flag. Great Britain has by far the greater portion of the carrying trade. There were 52,794,497 bushels of grain exported from New York.

The Interstate Commerce Commission has received telegrams from Chicago and St. Louis commercial bodies protesting against the discrimination between carload and less than carload shipments, and declaring such discrimination to be arbitrary and a restriction upon trade, contrary to the spirit and letter of the Interstate Commerce law. These telegrams are considered important as a rebuttal of the claim of the railroads that the discrimination practiced is beneficial to the West and causes complaint only in New York.

Importations of railroad iron at New Orleans are larger than usual.

A Detroit paper is informed by a gentleman who has just returned from an extensive trip through New York, New Jersey and the Eastern States that in only a single instance did he find a train heated with steam from the locomotive. The car stove is yet with us.

Something has been said about the cooperation of Italian consuls in the United States in a banking scheme, with the object of establishing an Italian bank in New York and other large cities in this country. A foreign dispatch indicates that this movement is only part of a general plan for the reorganization of all Italian banks in a national system, with a view of not leaving any branch of the national trade and industry unprovided for. The Italian Government has expressed the intention of creating a banking institution for Italy's colonial trade—"Instituto di Credito Coloniale." Sig. Grillo, one of the most eminent financial authorities of the country, has been intrusted with the task of elaborating the scheme.

The Washington Bureau of Statistics reports that 509,281 emigrants arrived at ports in the United States during the year 1887, exclusive of those from Canada and Mexico, against 386,631 during the previous year. Great Britain furnished 177,400; Germany, 111,000.

The Government of Hayti has incurred within a year or two heavy financial obligations both in England and France, and it is hinted that repudiation is more than possible, a measure which would lead to new hostile demonstrations against the island and entail new humiliations.

Augustus Howe, Sr., who died last week in Elizabeth, N. J., was an old New York merchant. Previous to the war he was engaged actively in the hardware business, in which he was remarkably successful.

The Inman steamer City of Berlin has been refitted with improved machinery, occupying less space, but exerting greater propelling power. Two other large steamers, the City of New York and City of Paris, each of 10,000 tons, will be added to the line next summer. The City of Berlin has been fitted with new triple-expansion engines, with cylinders 41 inches, 65 inches and 101 inches by 66-inch stroke, and which are capable of developing 5500 independent horse-power. The steam is supplied by eight boilers of the cylindrical return tubular type, each having three furnaces. The boilers are made of steel, and have a working pressure of 150 pounds per square inch. The space occupied by these

boilers is much less than was taken up by the old boilers, and the consumption of fuel is smaller. The City of New York measures 525 feet at the water line and 560 feet over all.

The smaller brass, steam and water goods manufacturers and the plumbers and minor jobbers of this city are said to be in trouble. The manufacturers' association of this trade passed a resolution which went into effect at the beginning of this month, giving all dealers the benefit of trade prices in case of the purchase of $5000 or more per year in goods from the association. The effect of this, say the small dealers, is to make it impossible for them to earn a living. They urge that an average between the trade price and the highest discount given is the lowest figure at which a profit is possible to the small dealers, and now the business will be massed in the hands of the large houses unless some means of relief are devised. The jobbers say they will make strong efforts to protect their interests.

Eight large steamers were launched at Cleveland during the past year, and it is said that more than that number are under contract for the year 1888. The success of her ventures in this line has encouraged the merchants of Cleveland to call the muddy stream of Cuyahoga "the Clyde of the Western World."

The increase of iron ore receipts at Lake Erie ports in 1887 was 56 per cent. over those of 1886, and the amount of ore on the docks at the close of navigation was 61 per cent.

The Congressional committee charged with the consideration of the Reading strike to ascertain where the responsibility lies for the many disastrous consequences affecting business has agreed upon a majority report, by the terms of which the whole matter is to be referred to the Interstate Commerce Commission for such action as it may see fit to take in the premises. The minority of the committee will recommend a Congressional investigation.

Geo. A. Butler, who was private secretary to Burlingame, United States Minister to China, and who is personally acquainted with the most prominent Chinese statesmen, speaks dubiously of the final outcome of the financial scheme initiated by Count Mitkiewicz, but remarks that three months hence the result will be known. The reasons for the favor with which Americans are regarded by the Chinese Government, as compared with other nationalities, and which fact may have some bearing on future railway enterprises in that country, are succinctly stated by him as follows: "The United States and Belgium are the only countries whose interests do not clash in some way with those of China. The English are in Hong Kong and Burmah. The French are in Tonquin. The Russians are all along the Northern and Western frontiers. Commercially speaking, the Germans are everywhere. The Chinese are afraid of them all, for the Empire is not so closely welded that it could not be riven asunder by foreign influence or by war. The French and English have possessions along the frontier of the populous province of Kwan Tung and that of Kwangsi, which are hotbeds of rebellion. China knows that English policy, whether political or commercial, is purely selfish, and she is not inclined to give that power any stronger foothold in the country than it has at this moment. The commercial spirit of Germany is considered almost equally aggressive. The interests of China and the United States do not clash anywhere, which is a sufficient reason that Li Hung Chang should have shown the disposition that he did and which I do not say he will not show again, to grant special privileges to an American syndicate. China would also like to have some disinterested country like the United States which, in case of trouble with other nations, might act as arbiter."

Capt. Ambrose Snow, one of the most active shipping merchants in New York, makes a good point in favor of American shipbuilding in a communication which he forwards to the newspaper press in explanation of statements made by him in a recent public address. He says: "The reasons which I wished to convey were, that when the ships of any flag appeared in a country they represented their own country's interest, and turned trade in the direction of the country to which they owed allegiance. My desire was to show that so many foreign flags must, in the nature of things, exert a great influence in diverting trade into channels chosen in their own interest. I stated that the employees and agents of the great lines of steamships which visit our ports filled our exchanges, and exerted a controlling influence. I reside at quite a distance from some of our large retail stores. I often hear it remarked that such or such a store "must be doing a good business; we see their cart very often." Don't you think it is time that this country should look into this business, and lay plans for sending some of our products to market in our own boats, built and driven by our own people? The foreigners now in possession of our carrying trade are doing just what it is their duty to do, and what we ought to be doing in all the seaports in the world; namely, exerting our influence in favor of our own country, as they exert theirs for their countries. My purpose is not to excite disagreeable reflections as to nationality, but, if possible, to arouse our own citizens to a sense of what a mistake it is for us to neglect an industry that in all times has been regarded as indispensable to any country desiring mercantile prominence."

A great freight blockade at Ogden, Utah, is said to be occasioned by the refusal of the Central Pacific Railroad Company to provide means of transportation, with the object of diverting freight to the Southern Pacific, and San Francisco merchants affirm that it is "due to the schemes of the Central Pacific management." The latter ascribe the blockade to obstructions caused by severe weather and to delay in filling orders for additional rolling stock.

The new army bill, which is expected to receive the sanction of the German Reichstag, increases the strength of the army by 700,000 men, and the initial cost of putting the change into effect, not considering the subsequent annual expense, will be $70,000,000.

The President has approved the postal convention recently concluded between the United States and Canada. By this convention articles of every kind or nature which are admitted to the domestic mails of either country will be admitted at the same rates of postage and under the same conditions and classifications to the mails exchanged between the two countries, except that articles other than letters in their usual and ordinary form are excluded from the mails unless they are so wrapped or inclosed as to permit their contents to be easily examined by postmasters or customs officers. All articles exchanged under this agreement are required to be fully prepaid, at the rate of postage applicable to similar articles in the domestic mails of the country of origin. Articles other than letters in their usual and ordinary form, on their arrival at the exchange post office of the country of destination, will be inspected by customs officers of that country, who will levy the proper customs duties upon articles found to be dutiable under the law of that country. Under former arrangements complicated customs regulations required consular certified invoices in sending articles of merchandise out of the country by mail; and these, as Superintendent Nicholas M. Bell has said, "have virtually proved prohibitory of American trade in certain classes of goods." All this process will be dispensed with after the 1st of March for Canada, as it already has been for Mexico. Our Post Office Department has now pending 13 other parcel post conventions with States of Central America and South America and the West India Islands. It is probable, therefore, that the postal system of the entire New World will, in the immediate future, be re-arranged on a common basis.

The inadequate defences of British coaling stations was a subject discussed in the London Chamber of Commerce and the position taken that the existence of the empire depended upon its power to keep commerce free from alarms. Preparation for contingencies was the truest economy.

The Lighthouse Board has received a report from the keeper of the Tillamook Rock Light Station, Oregon, being a record of the breaking of the sea at a point nearly 160 feet above high-water mark. The storm lasted seven days, and was one of the severest known on the Pacific coast. The lighthouse is built on a rock which rises 96 feet above high-water mark, and the focal plane of the light is 38 feet higher still. During the storm the action of the sea was so violent that the water rose at least 25 feet above the tower, shattering the storm panes and extinguishing the light. It is stated by a member of the board that there is no other authentic record of the breaking of a sea at such a hight.

A bill introduced into the New York Assembly incorporates the New York and New Jersey Bridge Company, with a capital stock of $10,000,000. The directors are empowered to lease the bridge to any railroad corporation, and may consolidate with other incorporations. George S. Field, William Libbey and George Hoadley, of New York, are the commissioners named to locate the bridge, which will probably be near Spuyten Duyvil. The bridge shall be 135 feet clear above high water at spring tide, and the piers shall be built with spring benders. The distance between the piers is not fixed. The plans for the bridge must be approved by an engineer. Commissioners to be appointed by the Governor at a salary of $6,000 per annum.

The Collector at Oswego, and business men there, agree in representing to the Treasury Department that there is no discrimination against United States vessels passing through the Welland Canal; but that United States ports and water routes are discriminated against to the great detriment of our people and our own commerce, the object being to induce the exportation of grain via the St. Lawrence River.

The engineers engaged in the survey for the proposed Nicaragua Canal, are receiving the co-operation of the Government of Costa Rica. The route which has proved the most popular, and which is now being located, will border upon the territory claimed by Costa Rica, from three miles below Castillo to about three miles below the mouth of the San Carlos River, where the dam is situated, and should the treaty between Costa Rica and Nicaragua be sustained as valid, one bank of the canal for this distance of 24 miles along the San Juan River will be the boundary of Costa Rica.

Of all the great cities of the world, Berlin now stands first in the matter of utilizing sewage. Twelve thousand acres of the unfertile plains about the city are being enriched through conduits from its reservoir sinks and powerful pumps. Paris proposes to adopt a plan of the same general character.

The Iron Age

New York, Thursday, February 2, 1888.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
JAMES C. BAYLES AND
CHAS. KIRCHHOFF, JR., - EDITORS.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - HARDWARE EDITOR.
JOHN S. KING, - - - - BUSINESS MANAGER.

Although the coke operators of the Connellsville region have held a number of meetings recently for the purpose of completing the organization of a coke syndicate, and have steadily announced to the public previous to each meeting that the desired object was about to be successfully carried out, we have to report that so far nothing has been done, and from present indications it is extremely doubtful if a syndicate will be formed. Several weeks ago it was announced that the pool had been agreed upon, and all that was necessary to complete it was the signing of the papers. As sufficient time has elapsed for these to be prepared and signed, and as it has not been done, it is reasonable to suppose that something unexpected turned up. It is said that the whole trouble has been with the four members of the old syndicate, particularly the H. C. Frick Coke Company. When the syndicate dissolved through this firm conceding the demands of the strikers, Mr. Frick claimed that it was formed to control prices, and not wages, and demanded the difference between the old contracts he had on hand when his company joined the syndicate and the market prices. This claim was at once refused by the other three members of the syndicate, and, as it amounts to between $75,000 and $80,000, it is hinted that the courts will be called on to settle the matter. The coke trade is reported dull, and the two days' shut-down scheme to lessen production has been resorted to. An improvement is not looked for till a resumption of work in the rail mills of the country takes place. As near as can be learned there has not been any serious break in the price established some weeks ago—$1.75 per ton—although some coke is said to have been sold at a slight reduction from this figure.

During the year 1887 the Lackawanna Iron and Coal Company used in their Scranton blast furnaces about 10,000 tons of fine separated magnetic ore from Chateaugay. For about three months they used about 25 per cent. of this fine ore in one of their furnaces, in addition to the usual quantity of fine material contained in the other ores of the mixture. Subsequently they ran another furnace for several weeks on 50 per cent. of fine separated Chateaugay ore in addition to the usual run of fine material. In both cases the fine ore seemed to work well, and no trouble was experienced in using it. When running on 25 per cent. of the fine ore they had the furnace on four-fifths Lackawanna anthracite, and one-fifth coke. At the time when they were using 50 per cent. of fine separated ore their furnace was using two-thirds anthracite and one-third coke, though Mr. E. S. Moffat, furnace manager, expresses the opinion that they could have gotten along very well with less coke. Mr. B. G. Clarke, the president of the Lackawanna Iron and Coal Company, looks upon this achievement as one which may have an important bearing on the future, and one likely to prove highly stimulating to the introduction of concentrating machinery. So far as we are aware, the general conviction among blast furnace managers is that anywhere from 10 to 15 per cent. of fine ore represents the maximum which can be carried in a burden as such without seriously affecting furnace work. For many years the problem of using fines has engaged the attention of inventors, and many proposals have been brought forward chiefly in the direction of bricking the fines. Another interesting fact recently brought out is that in the cases of some New Jersey ores it has been possible by concentration to eliminate very largely the phosphorus mineral in the run of the rock, and it is possible that in some cases ores heretofore considered unfit for use in Bessemer mixtures may be brought down low enough in phosphorus to be valuable for the manufacture of Bessemer pig.

Interest in the natural gas question at Chicago has by no means abated. More of it is found as investigations continue. The Chicago Raw Hide Belting Company have discovered that an artesian well on their premises discharges so much gas with the water issuing from it that they will probably be able to use it as a substitute for coal in operating their works. Wherever the flow of gas has been observed the supply continues steadily. Analyses of the gas which have been made thus far show it to contain only about half as much marsh gas as that of Western Pennsylvania. Arrangements are being made by a number of well owners to shut off the water and secure a flow of gas alone, when its exact constituents can be accurately measured. Wells are being bored specially for gas in various localities in the vicinity of the city, but none of them have thus far developed a supply of high-pressure gas. At East Chicago greater progress has been made than elsewhere, so far as known, but that well has not yet perforated the Trenton rock, upon which the expectation of securing a flow of gas is based.

The "Steel-Rail Trust."

The persistency with which certain daily newspapers speak of the "Steel-Rail Trust" is evidently inspired by very questionable motives. The odium which attaches to the word "trust" with the general public is utilized to create prejudices against great industries. Lately the Philadelphia *Times* has lent itself blindly to the schemes of those who systematically misrepresent the iron trade. In a recent issue we find the following:

If the sincere friends of American industry would protect protection they must promptly separate it from the extortion of trusts and monopolists. It can survive the hostility of open, manly foes; it cannot survive the suicidal blows of those who use protection only to abuse it by the arbitrary oppression of consumers that would not be tolerated in despotic Russia. Of these trusts or combines which are now hanging like millstones about the neck of protection, the Steel-Rail Trust is the most defiant of common fairness and most false to the protection that created it and gave millions of profits to its investors. Under open home competition, steel rails were sold at $27 per ton, and then sold at a profit to all who were properly equipped for producing them; but all the steel mills are now united in a trust or combine, and the price demanded for steel rails is $40. The high protection needed to develop this important industry is now not needed, but it still remains in our tariff laws, and the manufacturers combine and put up the cost of their product to the outside price that will exclude foreign importation. The result is the obviously just refusal of railways to buy steel rails, and the combined manufacturers have closed their mills and thrown their labor out of employment to coerce consumers to pay an extortion of $10 or more a ton to gratify organized greed.

As a matter of fact there is not in the whole iron and steel trade a single "trust" in existence, assuming that a correct definition of the word implies the formation of an association modeled after the Standard Oil Company and the Cotton-Seed Trust. As we understand the principles underlying the formation of a trust, it is that the individual producers entirely abandon their identity as such, and surrender the control of their property absolutely to a board, who fix the quantity to be produced, decide what plants shall continue to work and what shall be idle, as well as upon the price at which the product is to be sold. In that sense there is not a single trust in the iron and steel trades to-day. There are a number of combinations, as there are in every great industry, some of them strong, well organized and powerful; others, so far as their influence is concerned, little more than associations in name. With possibly one or two exceptions all efforts to control prices by agreement have been miserable failures of late years. The growing conviction among sellers as well as buyers has been that the only means of preventing ruinous demoralization has been to adopt some system of keeping exuberant production within bounds. Experience in nearly all branches of the iron trade has shown that an abuse of the power which such combinations may wield leads inevitably to growing outside competition and years of widespread disaster. Even when conducted cautiously the majority of the manufacturers follow the principle "in times of peace prepare for war." The result has been that few combinations have outlived even a year's dull trade, and that harmony reigns supreme only when the demand is so great as to give all full employment.

Turning now to the so-called "Steel Rail Trust" in particular, it was organized at a time of great depression, but almost coincident with the beginning of an enormous increase in the demand, so that the question may fairly arise whether values would not have risen just as rapidly from the lowest point, about $26, to the highest, $40, even if there had been no organization whatever. With the unprecedented new mileage of 1887, of 13,000 miles, every mill in the country had all it could do, pushing work with an energy of which American ironmasters alone are capable. As soon as the demand fell off prices rapidly declined to $31.50 at Eastern mill, in spite of a feeble effort to graft upon the original plan of organization an understanding making a slightly higher price the minimum. The plan alluded to, and the one found by recent experience to be the only practicable one, was to estimate the requirements of the country, and apportion the aggregate among the different mills, roughly, according to their capacity to produce. The plan, as originally

adopted and practically now in force, does not impose the slightest obligations upon any member of the organization so far as prices are concerned. Every one is absolutely free to sell his products at whatever figures he sees fit, and, as a matter of fact, some mills have taken business at figures confessedly below the cost at other works. The drop from the maximum quotation of $40 at which, by the way, very few rails were sold, to $31.50 in about six months should pretty thoroughly dispel any notions that "greed," even if it would, could control the steel rail trade. The competition of makers, East and West, is as keen as any opponent of trusts could well wish it. The rail trade, more than any other industry dependent upon the requirements of the railroads, suffers from the enormous fluctuations in the demand. Again and again, as we have shown lately, the quantity called for has doubled or trebled in a few years, to fall off to very small figures in a brief period. It is clear that such fluctuations must mean much idle capital and unemployed plant in one year, followed by terrific strains upon productive capacity shortly after. In other words, a brief season of active demand must compensate for long periods of low returns or actual loss. So thoroughly do our leading rail-makers understand this feature which it is beyond their power to remove that in years of general dullness they remodel and improve plant until American practice has become the model and wonder of ironmasters the world over.

The great merit of the allotment system adapted not only to the producer but also to the consumer is that its effect is to some extent to mitigate the evils growing out of alternate periods of idleness and strained activity. While it may be true that it tends to prevent a decline to figures at which only a few can work at all, it is equally true that it sustains equipment enough to prevent a rush of prices to exorbitant figures when the demand taxes the works to the utmost. Like the fly-wheel of an engine, it acts to prevent excessive variations, and in that manner confers benefits upon the consumer, since production by new works cannot be expanded at a moment's call, but requires at least a year of preparation.

Developments in Chinese Trade.

Whenever China has had a war with one or more of the maritime nations the sacrifices she has made have been more than compensated for by some progress that has been forced upon her, and in this manner both the victor and vanquished have been benefited by a struggle usually soon brought to a close. The late Franco-Chinese war found China but ill prepared to cope with one of the most formidable navies afloat, yet she stood her ground better than had been expected, and China now has a respectable fleet of the most modern war vessels. The permanent army has an effective strength of 300,000 men, and in the event of war may be raised to 1,000,000 with comparative ease. Both the army and navy are well equipped, yet China has accomplished all this without running into debt, paying everything out of her current income. All China owes abroad to-day is 6,500,000 taels, the tael equaling $1.20 American, the internal debt at the same time not exceeding 30,000,000 taels.

In railroad building China is no further advanced than Hayti, there being strong prejudices against them in all classes of society, because inland navigation is so complete in China and from it so many millions earn their daily food. Yet China is to have them. On the other hand, there are in operation some 14 telegraph lines on shore, and the cable lines on the coast are worked by the Great Northern and the Eastern Extension Telegraph Companies. The postal service is performed under supervision of the War Department, and is divided into "messageries" and mails, there being 8000 offices of the former and 2040 post offices, the latter involving an annual expenditure of 2,000,000 taels. This branch of the public service is said to work creditably.

The Chinese are also to have a new coinage, and 90 coining presses and all necessary machinery for fitting up a mint in China will be ready by next April. The presses, which are being prepared in England, are noiseless and automatic, and are capable of producing 2,700,000 coins per day of 10 hours. The coins are to be dollar pieces and three subdivisions—a half, a fifth and a tenth—in silver, as well as the "cash" or "mils," equal to one-thousandth part of a dollar, in rolled brass. Of the 2,700,000 coins which are to be struck per day, 100,000 are to be (if required) silver dollars. The extent of the order may be estimated from the fact that the Royal Mint in London is only furnished with 16 presses.

Following are the latest official trade returns received from China:

Total Trade of China.

	1886.	1885.	1886.
	Taels.	Taels.	Increase and decrease.
Total trade through all Marine Custom Houses	283,373,823	265,361,450	+18,012,373
Net import ...	87 479,323	88,200,018	— 720 695
Export.	77,206,568	65,005,711	+12,200,857
Duties collected by the Marine Custom Houses.	15,144,678	14,472,765	+ 671.913

Import and Export of Leading Articles.

Import.

	1886.	1885.
Opium, taels	24,988,561	25,438,914
Cotton goods	29,049,653	31,500,000
Woolens	5,630,948	4,824,056
Petroleum, gallons	22,800,000	14,700 000
Metals, taels	5,319,102	5,500,000
Matches	804,835	1,026,644
Needles	273,148	260,982
Window glass	185,749	165,789

Export.

Tea, taels	33,504,820	32,269,040
Silk, taels	28,800,000	20,000,000
White sugar, taels	488,659	667,464
Brown sugar, taels	1,054,745	1,067,100
Sugar candy, taels	139,999	151,039
Straw braids, taels	2,089,185	1,874,304

The increase in petroleum importation and silk exportation will be observed.

Fourteen Years of Chinese Trade (in Thousands of Taels.)

Year.	Net import.	Export.	Total trade.	Revenue from customs.
1873	66,637	69,451	136,088	10,977
1874	64,360	66,712	131,073	11,497
1875	67,803	68,912	136,716	11,968
1876	70,269	80,850	151,120	12,152
1877	73,233	67,445	140,678	12,067
1878	70,804	67,172	137,976	12,483
1879	82,227	72,281	154,508	13,531
1880	79,293	77,883	157,177	14,258
1881	91,910	71,452	163 363	14,685
1882	77,715	67,336	145,052	14,085
1883	73,567	70,197	143,765	13.286
1884	72,760	67,147	139,908	13,510
1885	88,200	65,005	153,205	14,472
1886	87,479	77,206	164 685	15,144

The Franco-Chinese war hardly affected Chinese trade. Since January 1, 1888, bonded warehouses have begun to be thrown open to the foreign trade, a commencement having been made with Shanghai. The greater the facilities are which China extends to commercial nations the more solicitous will the latter be to extend relations on a mutually satisfactory basis.

Countries With Which China Traded (in Thousands of Taels.)

From and to.	1885		1886.	
	Imp'rt.	Exp'rt.	Imp'rt.	Exp'rt.
England	23,992	21,391	22,035	19,746
Hong Kong	35,268	15,870	34,890	22,553
British India	16,149	589	16,980	532
Straits	1,725	999	1,236	940
United States	3,315	8,298	4,647	9,686
Continent without Russia	2,518	7,304	2,749	11,928
Russia (Odessa)	2	947	1	1,470
Overland	193	3,906	....	4,948
Japan	5,264	1,491	5,691	1,222
Other countries	981	3,611	1,081	4,182
Totals	89,407	65,006	89 310	77,207
Re export	1,207	....	1,831	....
Net totals	88,200	65,006	87,479	77,207

The American trade with China was as follows:

Fiscal year.	Import into the United States.	Domestic export.
1887	$19,676,780	$6,216,626
1886	18,972,993	7,518,277

China has held her own in the world's markets of late years, except so far as tea in England is concerned, where the leaf from British India begins to supersede the same rapidly and seriously, not only because the quality of Indian tea is more and more appreciated, but owing to its cheapness as compared with Chinese.

Negro Rule and Civilization.

Are Hayti, Jamaica and other points in the West Indies where the negro race dominates fast relapsing into barbarism? This is the question discussed by James Anthony Froude in a book recently published in England, which is producing much sensation. He gives deplorable accounts of the waste and desolation now prevailing, where, under British rule, there were not many years ago flourishing plantations of coffee, sugar cane and other productions which went largely into the export market. Mr. Froude says that he visited the islands free from prejudice. He returned with the conviction that the British colonies should be held firmly in the grip of a controlling power. Of Jamaica he says it will soon become another Hayti, and concludes that the island must be governed as England governs the subject races of Hindostan if she would save it from returning to a state of primeval nature. In the Barbadoes Mr. Froude says the blacks have found a congenial paradise. Warehouses are roofless, the wharves have fallen into decay, and the once thriving settlers have departed. Of Grenada it is said the desolations of the country prove the incapacity of the negro population for progress. The situation in Hayti is described in the darkest hues; it is "the most ridiculous caricature of civilization in the whole world"—its Government a mockery of representative institutions. Port-an-Prince, the capital, is "a Paris of the gutter," full of false pretensions and reeking with filth and immorality. Mr. Froude prescribes no remedy for the evils he depicts, aside from the suggestion that

England should recognize her responsibilities. There is so much corroborative evidence which may be gathered from other quarters tending to verify the general statements referred to that they may be accepted as substantially correct. They seem to indicate that the negro race in the West Indies require a direct governing power, and that to clothe them with authority means the eventual destruction, decay and paralysis of all productive energy. Industries cease, agriculture becomes nothing more than the spontaneous growth of exotic vegetation. The truth must be reluctantly confessed, that the once boasted "African Republic" of Liberia, so long the pet of American philanthropists, which was long ere this to be connected with the United States by a steamship line, a republic which was to rival Sierra Leone in the extent of its traffic in sugar, coffee, palm oil and other products—all to be developed with the aid of machinery sent out by merchants in New York, in conjunction with the transfer of American colonists from the Sunny South—is a complete failure. The late United States Minister Thompson spoke of it as a travesty, a burlesque, so far as it resembles any form of constitutional government. Thus far all experience, both on the part of the British Government and in the United States, goes to prove that the negro, in commerce and industry, becomes an uncertain factor except as subordinated to a superior supervising power, indispensable for its guidance in the path of a progressive civilization.

A New Departure in Puddling Iron.

The iron trade generally will be interested in a statement of recent achievements by the North Chicago Rolling Mill Company. For some three months experiments have been in progress at the Milwaukee works of this company in puddling iron, conveyed in liquid form from the blast furnace to the puddling furnace. The successful use of a similar direct process in their South Chicago Steel Works led the officers of the company to believe that it would be feasible in the puddling department of their Milwaukee iron works. It was no more necessary, they argued, to remelt iron for a puddling furnace than for a steel converter. At first one puddling furnace was tried, with satisfactory results, then an additional furnace was used, and in time others were added, until there are now, and have been for two weeks, four double puddling furnaces in regular operation upon this plan.

The results thus far accomplished have been very satisfactory, showing an improvement in every respect over the old method of operating puddling furnaces. The quality of the iron produced is most excellent. A sample bar is shown in the company's Chicago office which fully proves this statement. It is simply an ordinary muck bar, which was taken from the muck rolls to the blacksmith's shop, heated, drawn down to about ¼ inch in thickness, by 2½ inches in width, and one end then bent over and hammered flat hot while the other end was hammered flat cold. The iron was made from all Lake Superior ore, and, although such iron is usually red-short when puddled in the ordinary way, there is little evidence of such a tendency in the bar referred to, the end bent hot having endured the test for red-shortness without fracture. The end bent cold shows the tough fibrous structure characteristic of Lake Superior iron when treated in that manner. A considerable saving is, of course, effected in fuel as compared with the ordinary method of puddling, and this is a very important item for works situated a considerable distance from coal fields; but there is also a saving of time, which is fully as important, besides a lessening of the arduous work of the puddler and his helper. It has been satisfactorily demonstrated that in 7½ hours the usual five heats of a turn or shift can be made. No difficulty has been experienced in securing a uniform quality of metal from the blast furnace.

So far as known this is the first successful attempt in puddling blast furnace metal, and the North Chicago Rolling Mill Company may well feel proud of their achievement. They have probably inaugurated a new departure in puddling which is fully as important in its way as the revolution in the rail trade of this country in which they also were leaders. It will be remembered that on the 24th of May, 1865, this company rolled the first Bessemer steel rail ever rolled in the United States. It was made from an ingot produced at the Bessemer Steel Works of Captain E. B. Ward, at Wyandotte, Mich., wholly from Lake Superior ore.

While the officers of the company feel that they have accomplished a very important step in the manufacture of iron, which will assist it to hold its own against the inroads of soft steel for puposes to which iron is well adapted, they are not as yet prepared to furnish a full statement of the results developed by the new process in comparison with the old method. As early as possible this will be done, and our readers will then be more fully advised as to the methods employed and the technical details which have been found essential to success through elaborate experiments.

England's Dependence Upon American Orders.

For some time past the American and foreign markets—in the greater part of iron and steel products—have been too far apart to allow of much business being done. It is claimed by European trade authorities that enough business is coming in from other quarters to compensate for the falling off in the demand from the United States. Still the danger does exist that continued loss of orders from this side of the Atlantic may cause a decline there which may again bring values closer together. An analysis of the Board of Trade returns will go to show how important a factor in the greater export trade of iron and steel were the shipments to this country in 1887. We tabulate below the total exports of Great Britain, showing at the same time the rate of increase in 1887 over 1886, in per cent.:

Exports of Iron and Steel from Great Britain, Gross Tons.

	1886.	1887.	Per ct. over 1886.
Pig iron	1,044,552	1,159,500	11.0
Bar, angle, bolt	242,947	263,097	8.3
Railroad, all sorts	739,603	1,012,681	37.0
Wire and mfrs	40,341	46,449	15.1
Hoops, sheets and plates	307,756	351,418	14.2
Tin plates	334,692	354,773	6.0
Cast and wrought not es. spec	373,923	389,769	4.4
Old for re-manufacture	144,860	289,299	99.7
Steel unwrought	166,367	286,323	103.1

The increase in some instances has been very heavy indeed, and yet it will be found that the figures shrink very considerably when we deduct the quantities shipped in both years to this country, as under:

British Exports to Other Countries.

	1886.	1887.	Per ct. over 1886.
Pig iron	756,431	755,949	....
Bar, angle, bolt and rod	239,905	258,824	7.8
Railroad, all sorts	680,392	830,411	22.1
Hoops, sheets and plates	290,540	318,947	9.8
Tin plates	71,111	86,409	21.5
Cast and wrought	351,941	366,864	4.2
Old for remanufacture	79,417	116,372	46.5
Steel, unwrought	60,443	70,667	16.9

The quantities sent to the United States during the past three years has been as follows:

English Exports to the United States.

	1885.	1886.	1887.
Pig iron	113,499	288,121	403,559
Bar, angle, bolt and rod	2,159	3,042	4,273
Railroad iron	5,778	59,271	182,270
Hoops, sheets and plates	21,871	17,216	32,471
Tin plates	223,820	263,581	268,364
Cast and wrought	1,499	1,982	2,925
Old iron	14,398	65,443	172,927
Steel, unwrought	14,644	105,924	215,656

These quantities must be taken into consideration when gauging the importance of the shipments to this country to English iron masters. In the following table we place side by side the percentage of increase of total exports, the percentage of increase to other countries, and the percentage of the shipments to this country of the total:

	Total increase, per cent.	Increase to other countries.	Per cent. of United States of total exports. 1886.	1887.
Pig iron	11.0	....	27.6	34.8
Bar, angle, bolt and rod	8.3	7.8	1.2	1.6
Railroad, all sorts	37.0	22.1	8.0	18.0
Hoops, sheets, plates	14.2	9.8	5.6	3.7
Tin plates	6.0	21.5	78.8	75.6
Cast and wrought	4.4	4.2	0.5	0.8
Old for remanufacture	99.7	46.5	45.2	59.7
Steel, unwrought	103.1	16.9	63.7	75.3

A study of these figures proves in a general way that where the proportion of the business with the United States is small, the increase has been comparatively insignificant. This may be noted in the case of bar, of "cast and wrought iron," and of plates, hoops and sheets. The largest increase favorable to the English producers has taken place in railroad iron, though our demand contributed largely to the improvement. The heavier proportion of tin plates to other countries loses its significance in the light of the fact that fully 75 per cent. of the total exports come to the United States.

Very striking instances of the influence of our demand is shown in the exports of old material and of "unwrought steel." In the latter an increase of over 100 per cent. dwindles down to 16.9 and that only on a little more than one-third of the whole. Accepting as normal the shipments of 1885 English producers must be content to face the problem whether they can hold prices when the demand is lessened by 300,000 tons of pig iron, 175,000 tons of railroad material and 200,000 tons of steel, a total of close on 700,000 tons of manufactured and partly manufactured goods, not counting old material. On the other hand, too, the American trade may do well to consider whether the cutting off of such imports may not largely compensate for a decline in the home demand, especially since it occurs in the very lines in which the falling off is most expected—that is, in railroad supplies and in the raw material used in their manufacture.

CORRESPONDENCE.

Special Machinery.

To the Editor of the Iron Age: Please give me a description, prices, names of sellers, &c., of the materials, appliances, apparatus, machinery, chemicals, solders, and the composition and proportion of each component and material entering into the manufacture of the same, which would be the best and simplest to use for the following purpose; also the process or means of manipulating the above. I wish to put on to a 7-stranded twisted $\frac{1}{16}$ in. or nearly $\frac{1}{16}$ in. steel wire over all (the strands of course being very small), enough of the above solder to enlarge the ends of the wire for a distance of $\frac{1}{2}$ inch back from the ends to $\frac{1}{4}$-inch diameter. The solder should be strong enough, after having a thread cut on it its full length, and going through a $\frac{1}{4}$-inch nut on a turnbuckle whose threaded hole is $\frac{1}{8}$ inch diameter, and $\frac{1}{8}$ inch long, to resist at least 100 lbs. strain, and more if possible and practicable. Can there be a solder made that will stand more than that when of that size and thread? In other places I wish to put a head on the wire of the same diameter, and only $\frac{1}{4}$ inch long, to stand as much strain as the threaded end. Is there a machine made for doing it, and if not, who would make it? I would much rather have a machine to do it, and also a hand appliance to do it where the wires are in an inconvenient place to get at than to have the machine alone. JOHN E. ALDEN.

LAKE GEORGE, N. Y., Jan. 21, 1888.

Tinning Cast Steel.

To the Editor: Can you give me any information as to what solution I can use for tinning cast steel? I have some large cast-steel circles, 28 inches diameter, which are to be tinned on one side and edge, and have tried several methods without the desired result. Will you allow me to ask for your best knowledge on this subject?

E. P. W.

Melting Brass.

To the Editor: We wish to construct three new brass furnaces, large enough to carry No. 30 crucibles, and we would like to be advised as to the most improved method for melting brass. We have heard of a scheme for melting this metal without putting fuel under the pot, but having the fire around the sides and working it with a blast. A. A. H.

Tile Machinery.

To the Editor: Can you give us the address of a manufacturer of tile machines, or of some one who handles tiling for sub-irrigation? WM. CAMERON & CO.

GOLDTHWAITE, TEXAS.

Responsibility for Errors in Telegrams.

To the Editor.—DEAR SIR: Will you kindly, through your columns, give your opinion on the following? A firm, A. & B., in an Eastern city, are asked by a firm, X. & Y., in a Western city, to quote them on 500 tons of pig iron, delivered. The Eastern firm promptly telegraphed their price and confirmed same by letter; the Western firm telegraphed their acceptance of the offer, using the terms: "At price quoted in your message." When mail advices are received from the Western firm, confirming their telegraphic acceptance, it is found that the telegraph company had made an error in the transmission of the message, changing the figures $16.50, as written by A. & B., to $16.15, as received by X. & Y. X. & Y. claim that A. & B., under the above circumstances, are bound to deliver the iron to them at $16.15 per ton. A. & B. claim that they are in no way bound to do this, that their telegram quoting $16.50 was legibly written and confirmed promptly, according to business usage, by mail, that the telegram was delivered to a telegraph company, a common carrier, and that they (the telegraph company), if any one, are responsible to X. & Y. for loss resulting. Further, X. & Y., in order to set up any claim against A. & B. should have repeated in their message of acceptance the price named in A. & B.'s telegram as received by them, instead of using the terms, "At price quoted in your message." X. & Y. claim that A. & B., to protect themselves, should have had their message repeated to insure its correct delivery and avoid responsibility. A. & B. claim that this is not a business custom, and that their responsibility does not extend to the correctness of transmission of messages. Are A. & B. under obligation to ship on any other terms than their quotation of $16.50? Truly yours,

SUBSCRIBER.

This question has been raised in the courts of Georgia, Illinois, Minnesota, New Hampshire and Wisconsin, and in each of these States it was decided that the message received, and not that which was delivered by the sender to the telegraph company, is the original evidence of a contract created by it, and binds the sender. And a very recent case in Maine—Ayer *vs.* Western Union Telegraph Company—discusses the question with care. The court, the highest in the State, says that the question is important and not easy of solution; that it seems unjust that a telegraph company can bind a merchant to sell at less than his price for goods, but that it is equally unjust to a purchaser who may, in good faith, relying on the message, have sold the merchandise to arrive. The conclusion is then reached that the party who selects the telegraph as the means of communication shall bear the loss by the erroneous transmission of the message.

In the case raised by the inquiry here, it must be inferred that the quotation was asked for by letter: "A. and B. are asked by X. and Y. to quote them 500 tons of pig iron, delivered," and that A. and B. then used the telegraph for their reply: "A. and B. promptly telegraphed their price and confirmed same by letter." In the Georgia case the identical question was raised—that the sender was not bound to accept less than the price he put in his message—but the court declared that there was a completed contract at the price named in the dispatch received by the purchaser when he accepted the offer made in it. If X. and Y. had asked by telegraph for the price of the iron, or if they had desired A. and B. to reply by wire; or if, from any necessity, a telegram was the proper method of reply, or there was any custom or usage to answer such inquiries by wire, then it would seem X. and Y. must bear the loss. The Maine court said: "The first proposer can select one of many modes of communication, both for the proposal and answer, and we think the safer and more equitable rule, and the rule the public can most easily adapt itself to, is that, as between the sender and receiver, the party who selects the telegraph as the means of communication shall bear the loss caused by the errors of the telegraph company." It is not reasonable to expect a purchaser to repeat the price named in the dispatch of the seller, nor to demand that the seller repeat his message; these contentions are exacting and arise out of the controversial temper of the minds of disputants; business is done frankly and in confidence, not in doubt and suspicion. The question of "Subscriber" is, as the court has said, an important one, and it must be determined, so that business men may be safely directed, upon the basis of practical sense, as we think has been done by the courts we have quoted. We may add that the party injured by the gross negligence of the telegraph company in changing the quotations can recover his damages from it.—ED.

WASHINGTON NEWS.

(*From Our Regular Correspondent.*)

WASHINGTON, D. C., January 31, 1888.

The January balance of the cash condition of the public exchequer causes considerable anxiety among the projectors of a revenue reduction measure and no small degree of uneasiness and impatience in the mind of the President. The fiscal results of the first month of the year show the handsome revenue of $1,000,000 a day, or a surplus of $18,000,000 above expenditures made, or $14,500,000 net, which includes disbursements authorized, and represents the amount credited to the reduction of the public debt, but which appears as an addition to the surplus until disposed of by the purchase of bonds in open market or anticipation of interest.

Chairman Mills is now confident that he will be ready to introduce his bill "to reduce taxation and revise the tariff" by the middle of February. The bill in general outline, as far as completed and based upon the total amount of revenue to be curtailed, proposes the following results. Total reduction of customs duties $50,000,000, as follows:

Metal schedule: steel rails, $12 and pig iron $4.50 a ton and a general scaling down	$7,000,000	
Cottons and articles of general use.....	15,000,000	
Woolens.....	10,000,000	
Sugar, 20 per cent.....	10,000,000	
Chemicals and sundries	3,000,000	
Free wool, iron ore, salt and lumber	5,000,000	
Total.....		$50,0000,000
Internal taxes, repeal of tax on manufactured tobacco, exclusive of cigars and cigarettes and other minor items		25,000,000
Grand total.....		$75,000,000

There may be a modification or entire abandonment of the reduction on sugar. The Democrats of the committee are not particularly urgent upon this point, but have concluded to put it in, and, if accepted without material opposition, will permit it to stand. If the opposition should be serious they will withdraw that item and distribute an equivalent amount of reduction among the schedules of metals, cotton and woolen fabrics and other items in the existing schedules.

The General Committee on Ways and Means is not holding meetings at present owing to the recent action of the Republican members in expressing their unwillingness to attend unless they were assured of something to do. The Democratic members, however, are busily engaged on their work of devising methods of reducing the revenues which will not reduce.

The most experienced men in legislation give the opinion that the scheme of reduction, foreshadowed by the hints dropped by the majority members of the Committee on Ways and Means, will not accomplish the object in view; that, were it practicable to pass the proposed committee bill in its entirety, it would result in an increase of revenue on the one hand and a depression of home industry on the other. In the items in the metal schedule the increase would be particularly large. With pig iron at $4.50 a ton the overstocked markets of Great Britain would soon relieve themselves of their surplus production at a profit. This feature of the bill will be vigorously antagonized and can muster at least 30 votes in the Democratic ranks against any interference with the present rate of $6.72 on pig iron.

There is no doubt that there will be a considerable paring down on steel rails. There is an immense amount of pressure upon the committee and members of Congress to acquiesce in this reduction. The influence comes from many if not practically all of the great railroad companies in the United States. The investigation of the great combines to force up prices to an unhealthy figure has stimulated the popular cry against this branch of manufactures, which is included in the list now before the Committee on Manufactures. The members of this committee are disposed to make a recommendation to the Committee on Ways and Means backed by a statement which will be utilized in support of this reduction.

The 10-inch steel gun which was commenced under such favorable auspices at the Washington Navy Yard is still in doubt. The removal of the core is causing great trouble and unconcealed anxiety. The engineers in charge do not yet admit that the gun will be useless, will have to be abandoned and a new one made, but, from present indications, that will be the *finale* of their efforts. The other guns are being carried to completion to the entire satisfaction of the Ordnance Bureau.

An investigation is being made under the Engineer Bureau of the Navy Department of the facilities for the construction of the engines for the armored cruiser to be built at the Norfolk yard at some of the private establishments in that vicinity and Richmond. There is a disposition on the part of the Government to give the metallurgical industries of Virginia every advantage in the construction of that great floating engine of war which can be given consistently with results required by the official standards of quality of material and character of workmanship.

The Committee on Ways and Means have emphatically declined to grant any hearings to industries involved in the reductions in the tariff. A movement is gaining strength at certain industrial centers among the workingmen to organize in force and send numerously represented delegations to come here in their working clothes and demand a hearing in behalf of labor against any action on the part of the Committee which may tend to the lowering of wages. It is understood here that the preliminaries of such a movement have already been set in motion at the various points and that the delegates of labor men will only await the formal introduction and consideration of the proposed tariff reduction bill in general committee before coming here to ascertain in person whether the committee propose to come snap judgment on interests in which they are so directly and seriously concerned.

The Mullins Silicated Iron and Steel Company, Limited, of St. Louis, acquired late last year by compromise the Noel B. Wittman patent owned by the Pittsburgh Steel Casting Company, a fact which is of considerable interest, since this patent was employed by the latter concern in casting the gun lately. Mr. Noel B. Wittman's patent claims the use in the Bessemer process of additions of silica for the purpose of eliminating the oxide of iron formed in blowing, particularly when producing mild steels. Mr. Wittman has found that about 50 pounds of siliceous material is sufficient for a bath of 10,000 pounds of metal. He claims that experience has taught him that in producing low steels he can considerably lower the quantity of ferromanganese used in recarbonizing, and that it has been found that the use of additions of silica produces sound castings.

On the 26th ult. the citizens of Bellefonte, Pa., gave a banquet to Messrs. Collins Brothers, the occasion being the completion of the Bellefonte Furnace.

Open-Hearth Steel for Boiler-Making.

At the ordinary meeting of the British Institution of Civil Engineers, on Tuesday, January 10, the president, Mr. Bruce, being in the chair, a paper was read on "The Use and Testing of Open-Hearth Steel for Boiler-making," by the late Mr. Hamilton Goodall, Assoc. M. Inst. C.E.

This paper gave the experience of the author in the use of open-hearth steel for boiler-making since the year 1875, and described numerous experiments to ascertain the cause of the difficulties met with in working the plates. To avoid spoiling a plate by taking pieces from it for the purpose of testing a drifting test was adopted, in which washers were prepared from the material removed from the plates in making rivet-holes, and drifted in a special machine to the bursting point by means of a series of drifts having a taper of $\frac{1}{4}$ inch in 5 inches. In the majority of tests the washers were drilled out at right angles to the surface of the plate, but in some cases they were drilled out parallel to the surface; the outside diameter of the washers was $\frac{1}{16}$ inch, with a drilled hole $\frac{15}{64}$ (0.234) inch in diameter. Tests were also made to ascertain the load on the drift necessary to break the washer, and to establish some relation between the elongation of a washer and the elongation in a length of 8 inches of plate. Preliminary tests, with washers cut from shell plates, having an average tensile strength of 26 tons per square inch, gave an average drifting diameter of 0.645 inch; from back tube plates and furnace stiffening rings it was 0.644 inch, corresponding to an extension of 27 per cent. in 8 inches. These sizes were taken as the normal diameters for a good plate. The investigations of the author were specially directed to obtain a solution of the difficulties experienced in using steel plates, and included experiments on the welds of furnaces, the effects of hammering, of compression, of punching and shearing, of flanging, of annealing, of tests of defective plates.

With respect to welds of furnaces, tests were made with washers taken from five stiffening rings, flanged after welding; three of them were good welds and gave an average drifting diameter of 0.447 inch; the diameter of the other two was only 0.328 inch; a diameter of 0.406 inch was considered to indicate a fairly good weld. In a further test of washers from another stiffening ring $\frac{1}{2}$-inch thick, the diameters varied from 0.625 inch to 0.312 inch., the elongation being reduced to about 3 per cent. in 8 inches. This plate manifested no outward signs of being damaged.

Tensile tests proved that heating the ends of shell plates, and hammering to the required curve for butt straps or lap joints was, in some cases, injurious, the elongation having been reduced from 28 down to 6 per cent. in 8 inches. The plates were then set up cold, as tensile tests indicated that apparently no harm was done by this. But a number of drifting tests soon showed that the effect of cold hammering was to reduce the ductility of the material; the extent was equivalent to an average loss of elongation in 8 inches of from 5.01 to 7.89 per cent. Nor did annealing restore the ductility, as in all cases annealed washers from the unhammered part of the plate gave a larger drifting diameter than from the hammered part. Cold-hammering was therefore also abolished, and all bending was done in the rolls. Drifting tests of washers taken from a flanged end-plate, which cracked in riveting, were given. These showed considerable irregularity in the quality of the material, the results leading the author to believe that steel was distinctly inferior to iron in its ability to resist the effects of heating and hammering, which he attributed to an absence of homogeneousness.

Compression did not seem to be injurious. Drifting tests were made with washers cut from burrs, punched out of plates, and from plates squeezed up in a hydraulic riveter under a pressure of 20 tons per square inch. The thickness of the burrs had been reduced by the compression from $\frac{3}{16}$ inch to $\frac{3}{4}$ inch, and that of the plate from $\frac{3}{16}$ inch to $\frac{3}{4}$ inch and $\frac{5}{32}$ inch. The drifting diameter of the former was 0.614 inch and of the latter 0.687 inch; hence it was concluded that compression up to 20 tons per square inch was not injurious.

With regard to punching and shearing, experiments were made to determine how much it was necessary to chip off the edge of a plate so treated to prevent its cracking when stretched in flanging. Washers were taken from near the punched and the sheared edge, and from the solid part of a plate. The result was that the average drifting diameter of washers cut out at $\frac{1}{32}$ inch from the edge was a little less than from the solid plate; hence an amount of $\frac{1}{32}$ inch was all that was necessary to remove from the edge of a plate. When a piece of $\frac{3}{4}$-inch plate was flanged to a right angle, with a 3-inch inside radius at one end, diminishing to a square corner at the other, washers drilled out of the top of the radius and tested showed from their drifting diameters that a large radius was preferable to a small one; but that even with a large radius the inside suffered from the compression to which it was subjected. The drifting diameter of washers taken from the corner of a shell-plate, which cracked while being thinned under a steam hammer, varied from 0.5 inch to 0.687 inch, representing a difference of elongation in 8 inches of from 15 to 31 per cent. This method of thinning corners was, therefore, abolished, where practicable, in favor of scarfing them in a machine, although further tests of washers cut from plates worked in both these ways gave results almost identical. A plate overheated through flanging was found not to have sustained so much harm as might have been expected.

The author specially wished to direct attention to the following points: 1. Was a steel plate damaged by local heating? 2. If damaged, was it restored wholly or partially to its original strength and ductility by annealing? Had tests been made to determine these points? or, if not, were any results published to show that a certain percentage of steel plates had failed, while under precisely the same conditions, the percentage of failure with annealed plates had been less? From numerous tensile tests of plates unworked and locally heated, it appeared that sometimes the breaking strain was apparently increased by annealing, and sometimes diminished, the majority being in favor of the latter; with the elongation of the tensile and drifting tests, the reverse was the case. Drifting tests were made with washers cut from the saddle-plate of a furnace, from a top back shell-plate, and from a furnace stiffening-ring flange. In the former, the average tenacity and ductility were reduced by annealing, while, in the latter, the results with annealed and unannealed washers were practically identical; from this it did not seem that there was any advantage in annealing plates.

With regard to the effects of heat and respecting defective plates, the results of tensile and drifting tests, taken from a back tube-plate of special quality mild steel, an ordinary back tube-plate, a middle back-plate and a top back-plate, which cracked or otherwise failed in working, showed in some cases considerable drifting variation, and much irregularity in the ductility of the material. A diagram was given of a possible combination of contigu-

ous particles in a plate, as represented by the equivalent elongation in 8 inches. In the opinion of the author, the want of uniform ductility was the only remaining difficulty in the use of steel plates, and one which steel-makers might remove, if they could, by a thorough mixing of ingredients, making a homogeneous material; he believed if this were done little more would be heard of cracked plates.

Finally, the author stated the results of tests of plates of a higher tenacity than generally used; but the plates had not been specially prepared, and did not represent the best results obtainable. He suggested that if steel makers could increase the thickness of ingots and improve the homogeneity of the metal, there was little doubt but that plates of much higher tenacity could be used than at present. Probably in addition to the special mild steel for plates for furnaces, and the other quality, which was the same for flanging purposes and for shell plates now in use, it might be possible for steel-makers to introduce a third quality, for shell plates only, and by gradual steps to obtain a considerable increase of tenacity of the material. At the same time, a uniform width should be specified for the samples tested, and some stipulations made as to the minimum proportion to be allowed between the breaking strain and the permanent set. From figures supplied by Mr. E. D. Leavitt, Jr., of Cambridgeport, Mass., of tests of steel boiler plates, the average elastic limit was equal to 70 per cent. of the average breaking strain; whereas, in specimens tested by the author, it had been as low as 48 per cent., and had never exceeded 66 per cent. The paper concluded with a record of the experience of the author in regard to rejected and spoilt steel plates for boiler-making as compared with iron since 1875; the failures in working, and from defective plates, being greatly in favor of steel.

The National Union of the Sheet-Iron and Cornice Workers' Association closed their convention at Toledo, Ohio, 29th ult. The election of officers resulted as follows: A. Barnes, Kansas City, general president; George Scott, Omaha, general vice-president; A. Chatfield, Kansas City, general secretary; R. Kellerstrauss, Peoria, general treasurer. Executive Board—W. B. Parker, Memphis, Tenn., chairman; A. Chatfield, J. E. Bennett, Peoria; E. B. Lee, Youngstown; and Leo Hart, Omaha, Neb. Among the resolutions adopted was one favoring the eight-hour and a legal apprenticeship system. Not more than one apprentice should be employed to six or less journeymen in each shop. The next convention will be held at Peoria.

Notice has been issued to the stockholders of the Bessemer Consolidated Iron Company, who control the Gogebic group of mines on Lake Superior, that a meeting will be held on February 15, at Milwaukee, for the purpose of voting on the proposition to bond the company's property. This proposition has met with the approval of Tuttle, Oglebay & Co., of Cleveland, who handle the ore; Mr. Robert G. Ingersoll, attorney for the company; Mr. J. G. Butler, Jr., and Messrs. Wm. Windom and Stephen W. Dorsey. They all concur in the necessity of relieving the company of its present indebtedness, which has increased by $100,000 since August on account of the annual royalties since due on ten leases, and from the shipments of the Iron King ores. In round numbers the indebtedness is now $480,000 in all, of which more than one-half is due to John E. Burton, trustee, for cash advances. The plan is to issue $600,000 in bonds bearing 7 per cent. interest and running ten years, and with them pay off all debts and have a round $100,000 of bonds to push development work and prepare for output work next year. Mr. Burton estimates that the five mines can ship 250,000 tons, and that, as lake freights are certain to be reasonable, a profit of $1.50 may be counted upon, so that after paying $42,000 interest a balance of $233,000 will remain to pay dividends with. It is proposed after the second year to make provision to retire the bonds at the rate of $60,000 per year. Stockholders are asked to sign a proxy to authorize the use of bonds, and to sign an extension of the option until April 30. As the alternative, the sale of the properties to meet indebtedness is foreshadowed.

Canadian Trade.

According to the trade and navigation returns of the Dominion, just issued, the amount of customs duty collected last year was $22,469,705, the port collections having been Montreal, $8,895,505; Quebec, $709,508; Toronto, $4,273,038; Hamilton, $764,104; London, $581,697; Ottawa, $329,639; Kingston, $167,596; Clifton, $200,866; Fort Erie, $173,414; Windsor, $194,975; Halifax, $1,414,831; St. John, N. B., $835,806; Winnipeg, $504,583; Victoria, $815,546. By provinces the collections were as follows:

Quebec	$9,842,392.96
Ontario	8,084,842.69
Nova Scotia	1,795,288.40
New Brunswick	1,367,223.93
Manitoba	516,991.42
British Columbia	918,972.15
Prince Edward Island	156,232.53
Northwest Territories	21,594.73

The total imports and exports last year amounted to $202,408,047, being imports $112,892,236, and exports $89,515,811, the balance of trade against Canada having been $23,376,425. Canada's leading customers are Great Britain and the United States. During eleven years, since 1873, Canada's trade with Great Britain was greater than that with the Americans, but last year trade with Great Britain amounted to $80,534,079; with the United States, $82,767,265; West Indies, $4,017,593; Germany, $3,672,985; China and Japan, $2,819,584; South America, $2,625,066; France, $2,415,001; Newfoundland, $2,072,946; Belgium, $927,580. In 1868 the amount of customs duty paid per head of population was $2.62, and in 1887, $4.63. The imports of iron and steel were $9,746,000. There was an increase in 1887 of $4,264,897 over the exports of the previous year.

The Terrenoire Lavoulte et Bessèges Iron Works Company, at St. Etienne, France, have suspended payment. A demand for a judicial liquidation has been addressed to the president of the Paris Tribunal of Commerce, urging that the working of the foundries be continued in order that the interests of the creditors may be protected and the payment of the company's employees be assured.

The Philadelphia *North American* reports that a syndicate of capitalists is forming a company for the manufacture of compound steel armor plates, ship and bridge plates, rails, &c., under the Lauth patents. The process is the manufacture of compound steel armor plates of any thickness required—namely, a plate 12 inches thick, composed of 7 inches of 0.08 carbon steel and 5 inches of hard steel. The former is intended to act as a cushion and the latter as a positive resistance to the impact of the shot, and if so desired as many inches of soft steel can be put on the surface of the hard as may be required.

Mr. F. C. Roberts, of 3223 Powelton avenue, Philadelphia, has resigned his position as engineer of Messrs. Gordon, Strobel & Laureau, Limited.

Freight Rates on Ore for the Season of 1888.

Representatives of the ore-carrying railroad companies of the Lake Superior region met at Milwaukee on the 24th inst. to fix freight rates for the coming season between the mines and the lake shipping ports. Not being able to adjust matters satisfactorily at one session, another meeting was held on the following day at Chicago. The companies making Ashland their shipping port desired a differential of 20 cents to be established between their rates and those made by the companies connecting with other ports nearer to Cleveland and Chicago by water. The latter, however, were not willing to advance their rates on those of last season, which was the plan suggested by the Gobebic railroad companies, as they recognized the justice of the demands made by the mining companies and consumers of iron ore for a reduction in rates. The result was that rates were finally fixed for the respective mining districts by the individual action of the companies. The following schedule was made to Escanaba:

	Per ton.
Negaunee range to Ishpeming, including Cascade Branch of the Chicago and Northwestern Railway	$0.70
Menominee range, east of and including Florence	0.70
Menominee range, west of Florence	0.75
Felch Mountain range	0.70
Republic, Champion and Michigamme	0.85
Gogebic range	1.50

The rates of the Duluth, South Shore and Atlantic Railway are as follows:

	Per ton.
Ishpeming District to Marquette	$0.45
Ishpeming District to St. Ignace	0.85
Republic and Champion to Marquette	0.50
Republic and Champion to St. Ignace	1.00

The rates of the Milwaukee, Lake Shore and Western and the Wisconsin Central railroad companies are as follows:

	Per ton.
Gogebic Range to Ashland	$0.70

The rates to Escanaba have been reduced 10 cents per ton as compared with last season, but on the other routes there has been no change, although it would probably be a premature judgment to conclude that there may not be a lower rate established as the shipping season draws near. The iron ore mining companies and consumers are somewhat disappointed over the outcome of this conference over rates, as they had anticipated a reduction of at least 15 cents per ton on the rail transportation charges of last season.

The works of the Chicago Glass Mfg. Company, at Fortieth street and Wentworth avenue, Chicago, were damaged by fire last week, entailing a loss of about $40,000, covered by insurance. The loss would have been heavier if the workmen had not managed to prevent the liquid glass in the tanks from cooling. The cause of the fire was first ascribed to the use of oil for fuel, but subsequent investigation disproved the theory. The Edwards oil burner had been introduced into the works but a short time previously, and there was some prejudice against it on the part of the workmen, which gave rise to the rumor that oil had been the cause of the fire. Its origin has not been definitely traced.

Birmingham ironmasters regard the completion during 1887 of the Kansas City, Memphis and Birmingham railroad as a very important factor in the trade of Birmingham, Ala. It gives them an outlet for pig iron, bars and sheets into the growing territory of Kansas, and some of the new plants now approaching completion are credited with the intention of developing that trade vigorously.

A German Wire-Nail Pool.

Following the lead of the German wire-rod makers the producers of wire nails in that country have recently taken active steps toward the formation of a national combination. The total production of wire nails in Germany is estimated as follows by districts: Rheinland-Westfalen, 72,000 gross tons; Saxony, 30,000 tons; Upper Silesia, 14,000 tons, and South Germany, 20,000, a total of 109,000 metric or gross tons. Of this quantity home consumption absorbs about 66,000 tons, while 43,000 tons are exported annually. The first step toward the formation of the pool was taken by the majority of the works in the Rhenish Provinces and Westphalia and all the works of Upper Silesia, with the credited output of 75,000 tons. Promises have been received from the producers of Saxony, and the South German group is credited with the desire to form a separate organization which will hold the prices. Works with an aggregate of 17,000 tons in the Rhenish Provinces and Westphalia have not yet joined, among them two large establishments, which, however, it is said, are supplied with orders for the next five or six months; besides, they sell only about one-fifth of their output in the home market. The plan seems to be the establishment of a central selling bureau at Berlin for the home trade, and a branch at Hamm for export. It is insisted that valuable support will come to the combination through the German wire pool. The price for the first quarter of 1888 has been fixed at 15 marks for average assortment and the figure for the second quarter is soon to be established by the Berlin sales bureau. To the American trade the establishment of this association has only a remote interest, since we import very few wire nails, especially at the present time, when figures in the home market are so low, while the amount of business done for export is limited to the quantity used for petroleum cases and other export packages.

The Kellogg Seamless Tube and Mfg. Company, of Boston, are engaged in erecting their works at Findlay, Ohio. It is proposed to have their first machine for rolling seamless steel tubes made by the M. C. Bullock Mfg. Company, at Chicago. This machine weighs something like 70 tons, and will be in Findlay in about 90 days. Before its completion the necessary iron buildings for covering it and the additional machines, which the company will build in their own machine shop, at Findlay, will be completed, and by April 1 the headquarters of the company will be established there. Meantime, Mr. Charles Kellogg, the inventor of the system, will superintend the construction of the works at Findlay, and the first machine at Chicago. It is proposed to start the first machine as soon as the plant is ready for it and thereafter to increase the capacity of the plant until a daily production of 500 tons of pipe is reached.

Lackawanna is the name given to the new coal fields in the Black Hills. They are 10 miles southwest of Hot Springs, and cover an area of 12 square miles. The coal is bituminous, but there are thin strata of a hard, bright and extremely black coal, which is believed to be anthracite.

Mr. Geo. H. Babcock, in speaking of flying machines, in his presidential address, before the American Society of Mechanical Engineers, at the recent Philadelphia meeting, remarked that within the last five years the weights of engines have been reduced fully 37 per cent.

MANUFACTURING.

Iron and Steel.

The Union Steel Company, of Chicago, are putting into their steel works a liquid fuel plant to use crude petroleum. Two 1000-barrel tanks are being erected, into which the oil will be pumped from cars, and from which it will afterward be pumped as required into smaller tanks for use at the respective batteries of boilers. The officers of the company hope to be able to use it not only under boilers, but to substitute it for gas in the soaking pits and reheating furnaces. It will probably be some weeks, however, before the works are started, so that the practical operation of the new fuel plant cannot be immediately tested.

The Anniston *Hot Blast* reports that the Sheffield Furnace No. 1, at Sheffield, Ala., has gone out of blast for want of a sufficient supply of water. The pumps at the river supplying the furnace with water are found to be of too small a capacity.

The Pittsburgh Steel Casting Company have notified the officials at Washington of their readiness to submit the new steel gun to the preliminary tests of the Government experts. Superintendent Hainsworth says that in order to have a decisive test of the relative merits of solid and built-up guns a 6-inch cannon of the latter class should be tried at the same time by firing the shots alternately and as rapidly as possible.

Under date of January 23d the Cobb's Iron and Nail Company, of Aurora, Ind., announce that they have resumed the manufacture of nails, after a stoppage of three months, due to scarcity of coal through low water on the Ohio and Kanawha rivers.

W. H. Cramp & Sons, who have been awarded the contract for a Zalinski dynamite gun, have had the tubes for it made by the American Tube and Iron Company, of Middletown, Pa., and Youngstown, Ohio. The storage reservoirs are composed of tubes 16 inches in diameter, $\frac{7}{8}$ inch thick and 20 feet and over in length, and are subjected to an internal hydrostatic pressure of 4000 pounds to the square inch. The tubes composing the firing reservoirs are 16 inches in diameter, $\frac{5}{8}$-inch thick and 25 feet long and are subjected to a pressure of 2000 pounds to the square inch. The storage tubes weigh about 3000 pounds each, and are made of the finest quality of iron. The manufacture of these tubes is one of the greatest feats ever undertaken and accomplished in the line of tube making, the iron for same having been made by the Paxton Rolling Mill, Harrisburg. The tubes have been made and welded at the American Tube and Iron Company's Youngstown mills, and are being shipped to Middletown, Pa., for completion, after which they will be forwarded to their destination.

The Sharon Iron Company, of Sharon, Pa., are building two additional gas producers and two regenerative heating furnaces, also two trains of rolls. The furnaces are being built by J. V. Rose, of the above place, and will contain the latest improvements recently added by the builder.

Mr. H. G. Bond, general manager of the Decatur Land Improvement and Furnace Company, of Decatur, Ala., under date of the 23d inst., writes us as follows: "We have made a contract for the erection here, by parties from Chicago, of a gas plant for the manufacture of fuel gas, under patents owned by Burdett Loomis, of Hartford, Conn. The plant we require will cost not less than $200,000 and the Loomis Company agree to furnish fuel gas to all manufactories at a price not exceeding $1 per ton for steam coal, and for private house consumption at a rate not exceeding $1.50 per ton for coal. This agreement is for 20 years, and is subject to a proviso that in case fuel gas is furnished at a cheaper rate during that time within the States of Tennessee, Alabama, Georgia, Mississippi, or Louisiana, then Decatur is to have the benefit of any such reduction in price."

The Reading Iron Works, of Reading, Pa., under date of the 21st inst., write us as follows: "Owing to the miners' strike in the Schuylkill region we were obliged to use coke in the furnaces of our tube works and find it to work very well so far as heating capacity is concerned, but we have not used it long enough yet to determine the comparative cost between coke and anthracite coal, which latter fuel is our natural supply."

The nailers in the employ of the Laughlin Nail Company, of Wheeling, W. Va., whose works are situated in Martin's Ferry, Ohio, have refused to join the ranks of the Amalgamated Association. A majority of the nailers working in the various nail factories at Wheeling have recently become members of the above named organization.

The Brier Hill Iron and Coal Company, of Youngstown, Ohio, who have operated the Himrod Furnace under lease for some years, have surrendered the same and blew out one stack last week. The other stack has not been in operation for some months. An effort has been made to sell the above furnace plant, but up to the present time no sale has taken place.

The wages troubles which have existed for more than six months at the nail factory and steel plant of the Junction Iron Company, of Wheeling, W. Va., which is located at Mingo Junction, Ohio, were satisfactorily settled on Thursday, the 26th ult. From the Steubenville *Gazette*, of the 27th ult., we take the following information regarding the matter: "The basis of settlement is 16 cents for cutting nails, with 12½ off for self-feeders, when nails sell at $2 per keg, but is to go no lower. The heaters are to get 35 cents and the rollers are to get the same wages prevailing previous to July 1. The settlement is on the basis of the amalgamated scale for this district. These points being settled, it was an easy matter for the steel workers and the mill owners to agree. Here the only point of difference was the disposition of the product, the Amalgamated Association not permitting the steel to be sold to mills where there is a strike legalized by the association. In the Mingo case this took a very peculiar and inconsistent turn. The nailers and heaters employed by the company who operated the steel plant were on a strike and the company were not permitted to use their own steel. Now that the nailers and heaters of the Junction works had settled their trouble, it was an easy matter for the steel workers to settle theirs, which was done this morning, the company waiving the right to sell steel to any mill wherein there is a strike legalized by the Amalgamated Association. The mill will start up full next week or as soon as some necessary repairs are completed."

Emma Furnace, of the Union Rolling Mill Company, at Cleveland, Ohio, has been blown out for the purpose of being repaired. It will resume operations again in about three months.

The Pittsburgh Forge and Iron Company, of Pittsburgh, have just completed some very important additions and repairs to their works, which are located in the lower part of Allegheny City. This company formerly made a great many iron axles used by the Pennsylvania Company on its various lines, but lost their trade on these goods when that company decided to use only steel axles. On the 27th ult. one of the largest steel hammers in Pittsburgh was placed in the works, and steel axles will be made in a few days. The

hammer was made by Morgan & Co., of Alliance, Ohio, and strikes a 5-ton blow. An extension was made to the works and from 40 to 50 additional men will be employed in the steel axle department.

The rod mill of the Cleveland Rolling Mill Company, at Cleveland, Ohio, which has been idle since 1885, has resumed work on account of a large demand for rods. The rail and blooming mills, which have been idle for the past six weeks, will resume work about February 1.

The extensive improvements that have been in progress for the past three months in the works of the Apollo Iron and Steel Company, at Apollo, a few miles from Pittsburgh on the West Penn Railroad, are almost completed, and the mill will be ready to resume operations in full in a short time. Since the present company bought these works, two years ago, they have built in connection with them a large galvanizing works, one of the largest in the United States, also two large steel furnaces and hammer, and now give employment to twice as many men as when they took charge. Mr. Jacob Smith, of Pittsburgh, is the manager, who is assisted by Peter Baker. James Bolitha has charge of the steel workers, and James Gibson of the galvanizing department.

The blast furnaces of the Troy Steel and Iron Company, in Troy, N. Y., have been banked, the employees having refused to accept a 10 per cent. reduction of wages.

The Solar Iron Works of William Clark & Co., at Pittsburgh, which were closed several months ago in consequence of a disagreement with the Amalgamated Association in regard to the "two job system," resumed operations in all departments last night. A compromise was effected at a conference.

The manager of the Riverside Steel Works, at Benwood, W. Va., has notified the officials of the Knights of Labor iron workers' district that he will sign last year's scale. He asks for a conference on the 100-ton question and time and a half for Sunday work, and it will be granted.

No. 2 furnace of the Brooke Iron Company, at Birdsboro, Pa., has been banked.

The employees of the Continental Tube Works, in Pittsburgh, were asked a few days ago what reduction in wages they would be willing to accept. They met on Saturday night and decided that they would not accept a reduction, and so notified the manager yesterday. The employees of the Pittsburgh Tube Works and the National Tube Works, at McKeesport, have also been notified of a 10 per cent. reduction.

The Iowa Barb Wire Company, of Allentown, Pa., are experimenting with oil as fuel for their annealing furnaces.

At a meeting of the stockholders of the Benwood Iron Works held at the office of the company, in Wheeling W. Va., on the 24th ult., the following directors were elected: John G. Hoffman, L. S. Delaplain, A. W. Campbell, G. B. Caldwell, E. W. Paxton, L. F. Stifel and Jacob Wise.

Mr. Fritz Gleim's connection with the Bellefonte Furnace Company, at Bellefonte, Pa., has terminated, and he has accepted a position with the Solid Steel Company, at Alliance, Ohio. Mr. Walter Graham is the new chemist of the Bellefonte Furnace Company.

Mr. James F. Morrison, of the firm of Dougherty & Morrison, of Pittsburgh, manufacturers of boilers, tanks, &c., has just returned from Belleville, Ont., where he has been erecting a steel water tower 140 feet high and 30 feet in diameter. To withstand the enormous pressure the bottom plates were made $1\frac{1}{16}$ inches thick, which thickness was gradually reduced toward the top, the upper plates being $\frac{1}{4}$-inch thick.

The old Board of Directors and officers of the Kelly Nail and Iron Company, of Ironton, Ohio, were re-elected on the 25th ult. The directors are: W. D. Kelly, Lindsey Kelly, I. A. Kelly, B. S. Brown, Chas. Parrott, W. W. Franklin, Geo. N. Gray.

All the clerks and salaried men employed at the Edgar Thomson Steel Works of Carnegie Brothers & Co., Limited, at Braddock, Pa., have been temporarily suspended till the works resume operations. It is not known at present when this will take place.

Notices have been posted at the Pittsburgh Tube Company's works, at Pittsburgh, that a reduction of wages would take place, dating from February 1. The amount was not stated, but the general impression is that it will be 10 per cent. There are 800 men employed in the works.

Aaron French, D. C. Noble and Walter P. Hansell, liquidating trustees of the French Spiral Spring Company, Limited, of Pittsburgh, have filed in court a petition asking to be relieved from their trust, which had been fully carried out, and the petition was granted. When the company went out of business in July, 1884, the trustees received assets nominally valued at $114,458. Since that time they have collected and paid out $82,530 to creditors and $14,603 to members of the association. The remainder of the accounts in their hands are worthless.

The Allentown Rolling Mill Company, of Allentown, Pa., on the 23d ult. announced a reduction of 10 per cent. in the wages of employees.

At the annual meeting of the stockholders of the Belmont Nail Company, held last week in the office of the Company, at Wheeling W. Va., the following directors were elected: A. W. Kelly, A. J. Clark, Thomas O'Brien, George G. Hannan, William F. Stifel, Joseph Bell and Edward Reid.

The Warren Tube Company, of Warren, Ohio, a corporation composed of Akron capitalists principally, have discharged all their hands in the mill and office except watchmen, and now are confronted by suits aggregating $47,000, brought by the First, Second and Western Reserve National banks of that city; P. L. Kimberly & Co., of Sharon; S. Jarvis, Adams & Co., of Pittsburgh; First National Bank of Salem; Phœnix Iron Works, of Meadville, and the Mahoning Valley Iron Company. A $15,000 bonus and eight acres of land were given by the county to secure the plant, and by the agreement made this amount can be recovered on a failure to run in harmony with the company, and the money spent in developing a patent is credited with producing the result.

A dispatch from Greensburg, Pa., under date of the 25th inst., reads as follows: "Arrangements are now being made by which a large manufacturing establishment will be located here. On Monday representatives of Kelly & Jones, manufacturers of steam heating and ventilating apparatus, whose plant is in Jersey City, with branch offices in Pittsburgh and New York, were here looking at sites upon which to erect their plant. They agreed to remove here provided $50,000 in stock was subscribed and 10 acres of land was donated for their buildings. Yesterday some enterprising business men started out and secured the land from John Ruch. It is located at the southern extremity of the town. To-night the Board of Trade met to subscribe the stock. The company employ 300 skilled mechanics and their pay roll is upward of $4000 a week. The capital stock is $300,000 and they have been in operation 12 years. Their main building is 600 feet long, built of brick, with iron roof. If everything is arranged satisfactorily the new plant will be in operation by July 1. The Board of Trade adjourned this evening without taking action in the proposition of the Kelly & Jones iron firm to locate here. The meeting was fairly attended, and the only thing of importance done was the appointing of a committee to solicit subscriptions for the $50,000 worth of stock asked by the company. The committee will report at a meeting to be held next Monday evening. The possibilities are that the citizens will subscribe the amount and thus secure the plant."

The Homestead Steel Works of Carnegie, Phipps & Co., Limited, at Homestead, Pa., which have been closed down for some time, have resumed operations in all departments. A satisfactory arrangement has been made with the Amalgamated Association regarding the steel scale.

The annual meeting of the stockholders of the Glasgow Iron Company was held on the 26th ult. at Glasgow, near Pottstown, when the following officers were chosen for the ensuing year: President, Comly B. Shoemaker; secretary, J. Howell Leeds; treasurer, Joseph L. Bailey; directors: Comly B. Shoemaker, Joseph L. Bailey, Edward Bailey, Epraim Fritz and Benjamin H. Shoemaker.

George J. Humbert, formerly connected with Shoenberger & Co.'s Juanita Iron and Steel Works, Pittsburgh, Pa., has been appointed superintendent of the Glasgow Iron Company's Steel Works, at Pottstown, Pa.

The steel works of the Pottstown Iron Company, Pottstown, Pa., have shut down for the purpose of putting in a third large converter, and making other improvements that will add to the facilities of the works for steel manufacture. The furnace, rolling mills, nail works and other mills of the company are in full operation.

Both of the furnaces of the Roane Iron Company, at Rockwood, Tenn., are in blast. No. 1 stack is on native ore, making an average of 45 tons daily. No. 2 is on Cranberry ore, from North Carolina, making Bessemer pig from ore for the Roane Steel Rail Mill at Chattanooga. This mill is on single turn, making about 100 tons of rails daily. At the annual meeting of the company, held last week, it was decided to further improve the plant by constructing another steel converter, which will enable the company to put the mill on double turn.

Brice & O'Kelly propose to start an iron foundry at Little Rock, Ark.

A dispatch from New Glasgow, N. S., says: "Negotiations for the amalgamation of the Nova Scotia Steel Company and the Nova Scotia Forge Company are about completed. It is the intention of the combined companies to manufacture iron and steel on a much larger scale than hitherto, and new machinery will soon be added for its accomplishment."

F. A. Stratton contemplates the building of a blast furnace at Johnson City, Tenn.

Machinery.

The American Nail Machine Company, of Ashtabula, Ohio, have added a large lot of new machinery to their works and are running night and day on orders for their improved wire nail machines.

Lloyd, Booth & Co., proprietors of the Falcon Foundry and Machine Works, at Youngstown, Ohio, are making for the Sharon Iron Company, at Sharon, Pa., two housing and bed plates for a 22-inch sheet train. The first named firm have recently engaged Mr. C. W. Bray, who has had charge of the drafting department of the

Lewis Foundry and Machine Company, Limited, at Pittsburgh, and intend to improve their plant in the spring, by the erection of a new machine shop, additional tools, &c.

We understand that the late Prospect Engine and Machine Company (formerly the Cummer Engine Company), of Cleveland, Ohio, are under reorganization. This will involve the removal of the extensive engine works of Messrs. Barney & Kilby from Sandusky, Ohio, to Cleveland, and their consolidation with the new company.

Wm. Tod & Co., of Youngstown, Ohio, manufacturers of the well-known Porter-Hamilton rolling-mill engines, are about completing a large engine for the Chicago Arc Light and Power Company, 19½ inches high-pressure cylinder, 35 inches low-pressure cylinder, 34-inch stroke. This is the second engine of the kind furnished the Chicago company and is after plans designed by E. F. Williams, of Chicago.

The Hart Mfg. Company, of Cleveland, Ohio, manufacturers of pipe and bolt threading machines, under date of the 24th ult., write us as follows: "During the last two years our business has about doubled, and is still increasing, so that the quarters we now occupy are not large enough. We have purchased a piece of land on Prospect street, in this city, and are about to erect a brick factory. We do not expect in the future to confine ourselves to the manufacture of die stocks alone, and are now open to figure on the manufacture of some good article in the tool line. Our factory is now equipped with the latest improved machinery, to which we shall make many important additions. Our trade for 1887 was larger than ever before, and we feel encouraged with the outlook for 1888."

A certificate has been filed with the Secretary of State of Illinois to record the change of name of the Rockford Twist Drill and Bit Company, at Rockford, to the Rockford Bit Company.

A new foundry and machine works, of which Janney & McKersham are proprietors, has just gone into operation at Pottstown.

A. B. Pitkin, of Providence, R. I., has issued an extensive list of new and second-hand machinery, and mill and machine shop supplies, which he has on hand. The list comprises a large and good assortment, and may not be without interest to some of our readers.

Two new catalogues issued by the Lane & Bodley Company, of Cincinnati, Ohio, have just come to hand. One of them refers to their portable circular saw mills, containing illustrations, brief descriptions and price lists, while the other is devoted to pulleys, hangers and shafting.

Hardware.

At a meeting of the stockholders of the Wheeling Hinge Company, held at the office of the company, in Wheeling W. Va., last week, the following directors were elected: C. J. Rawlings, C. D. Hubbard, C. R. Hubbard, John Brown, C. A. Robinson, J. C. Brady and T. H. Logan.

Le Page's Liquid Glue and Cement Company, Gloucester, Mass., contradict the reports that they are unable to obtain the raw material from which to manufacture their glues, and state that they have an abundance on hand and contracts covering a term of years for all they can use. They are now preparing to enlarge their works to enable them to meet the demand of their increasing trade, and are running night and day gangs to enable them to keep up with their orders.

The Stover Mfg. Company, Freeport, Ill., erected early last fall a new foundry, 60 x 250 feet, with additional buildings, for the manufacture of light gray malleable iron castings. It is equipped with the most approved machinery, and is now in full operation, with upward of 75 men employed. The company's buildings are of brick, and built in a substantial manner and covered with an iron roof. The cupola is of the Colliau patent, and is capable of melting about 12 tons of iron per day. The entire works are heated by steam and lighted by electricity. They are situated in East Freeport, and connected by the C., M. and St. P. tracks, with switches to the various roads entering the city. The company are about to put on the market a line of spring hinges, which are referred to as new and novel.

It is reported that there will be in operation during February a screw factory in Bessemer, Ala. It is stated that 27 machines will be operated, with a probability that the capacity will soon be largely increased.

Miscellaneous.

A special despatch from Chambersburg, under date of the 24th ult., says: "The Caledonia Mining and Mfg. Company were incorporated at Harrisburg yesterday with a capital of $250,000, all of which has been subscribed and $30,000 paid up. The company will develop the great 12,000 acre estate of the late Thaddeus Stevens in Franklin and Adams counties. The privileges of the iron ore output have been sold to a syndicate of New York capitalists for a yearly rental of $17,000. Copper and tin mines and a granite quarry will be opened within 30 days. A branch railroad will also be built to the estate to connect with the Mont Alto Railroad."

The following corporations have recently received charters from the Illinois authorities: Galesburg Power Shear Company, of Galesburg, Ill.; capital stock, $50,000; object, to manufacture the Barton power shear; incorporators, I. H. Barton, I. V. Dietrich, Charles A. Webster, Marion Rhodes and W. P. Sisson. The Holson Horseshoe Company, of Chicago; capital, $50,000; incorporators, Henry Esdohr, Robert Lindblom, Henry Wulff, L. A. Reynolds and Albert B. Holson. The Industrial Iron Works Company, of Chicago; capital, $15,000; incorporators, W. H. Chenoweth, Frederick H. W. Chenoweth and Charles L. Chenoweth. Electric Supply Company, at Springfield, for the purpose of manufacturing fire and burglar alarms and other electrical apparatus; capital stock, $50,000; incorporators, Andrew Shuckman, Robert B. Hoover and Frank W. Wellman. Jewell Pure Water Company, at Chicago; capital stock, $500,000; for the manufacture of water filters, &c; incorporators, Frank F. Fisher, James McLean and William Devine. The Crane Elevator Company, of Chicago, have been granted permission by the State authorities of Illinois to increase their capital stock from $500,000 to $1,000,000.

The United Coal and Coke Company, at United, Pa, in the Connellsville region, have put out 100 coke ovens.

The Mt. Penn Stove Works, at Reading, Pa., are making preparations to go extensively in the manufacture of radiators, patented by Ezra F. Landis, of Lancaster.

Messrs. R. Lamson & Co., of Pittsburgh, Kan., have been running their new zinc works, at Nevada, Mo., since the middle of December.

The Denver Zinc Company have begun operations at Denver, and cast the first bar of zinc ever made, it is said, west of the Missouri River. It was reduced from Colorado ores. Mr. H. C. Rudge is the builder and owner of the plant. The capacity of this smelter is 6 tons of zinc per day, and it is the intention to soon double the size of the plant.

Foreign Markets.

EQUIVALENTS.

	Cents.
Franc, Peseta or Lira	19.3
Florin (Netherlands)	40.2
Florin (Austria)	35.9
Milreis (Portugal)	$1.08.
Milreis (Brazil)	54.6
Mark (Germany)	23.8
	Pounds.
Kilogram	220.5
Picul	134.

BRAZIL.

PARA, December 17, 1887.—*India Rubber.*—Our market during the fortnight under review has been weak and dull, owing to the rise in exchange, Fine being worth 2400 milreis, and Coarse, 1500. The steamers Portuense and Jerome took 376,389 kg. Fine and Coarse and in transit from Manaos 88,964 kg. *Exchange* on London, 90 days' sight, 23⅜d.—*O. Commercio.*

WEST INDIES.

PORT OF SPAIN, TRINIDAD, December 23, 1887.—*Asphaltum*—Has been fully sustained at the late advance and remains firm at $13.25 ℔ ton Boiled, and $5.50 Crude. *Exchange*, 90 days, $4.80 @ $4.86.—*E. P. Masson.*

NETHERLAND GUIANA.

PARAMARIBO, SURINAM, December 21, 1887.—*Gold.*—While placer mining has been carried on in this vicinity with tolerably good success for several years past, quartz gold is now also turning up to quite an extent. On the Upper Saramacca River, on land owned by Messrs. Rodrigues, Smith & Fennely, a vein has been discovered and the claim has been bought for an English company by Mr. W. L. McAlpin in the sum of £12,000. This gentleman also bought claims on lands the property of Messrs. L. & F. de Jong. Mining engineers and machinery are expected from England. The lands of Brown & Wessels also show gold quartz. The climate of Surinam is healthy throughout.—*Nederlandsche Courant.*

EAST INDIES.

COLOMBO, December 22, 1887.—*Plumbago.*—Since our last report the market has been quiet and steady at following quotations in rupees ℔ ton: Large Lumps, 145; Ordinary ditto, 115 @ 142.50; Chips, 80 @ 90, and Dust, 37.50 @ 60. *Coir Yarn.*—No. 1 to 4 is dull at 7@ 12 rupees ℔ cwt. Since October 1 26,156 cwt. went to England and 41,875 to the United States. *Exchange*, 1/5½.—*Volkart Brothers.*

PENANG, December 14, 1887.—*Tin.*—Receipts for the week sum up 13,000 piculs, of which 5700 were taken by Europeans and 7000 by Chinese. Opening at $58.85 Tin declined to $50, in order to advance to $55.25 and close at $53.85. Shipments since January 1 to England, 151,868 piculs; to the Continent, 3750, and to the United States, 15,590. We quote Gutta Percha, $60 @ $100, and India Rubber, $60 @ $70. *Exchange*, four months', 3/2.—*Schmidt, Kustermann & Co.*

MANILA, January 9, 1888.—*Hemp.*—Since the commencement of the year Fair Current has given way from £31. /17, cost and freight, to £30. 5/. Week's receipts were 5000 bales, making 8000 since January 1. *Exchange*, 3/8.—*Smith, Bell & Co.*

SPAIN.

BILBAO, December 24, 1887.—*Iron Ore.*—The sinking of the steamer Forest, with cargo, across the Portugalete entrance, has prevented other steamers from sailing for several days. The market has meanwhile remained steady at unaltered rates. January 17, 1888.—Since the beginning of the year few important transactions have taken place. Some single cargoes of Rubios have been secured at 7/, and of Campanil at 7/6 @ 7/8, and these prices are likely to rule for some time longer. A good deal of Ore has been shipped during the week, there being just about the number of steamers ready to load that is required to keep the trade going with tolerable briskness. *Pig Iron.*—Only 327 tons were shipped abroad during the week and 2404 tons coastwise. Total shipments since January 1, 56,174 tons, against 23,139 tons in 1887.—*Bilbao Maritimo y Comercial.*

GERMANY.

HAMBURG, January 21, 1888.—*Iron.*—Advices from Rhenish-Westphalia are not quite as cheerful as they have been for a couple of months past. The rolling mill syndicate do not find it so easy to dispose of their production, the present ruling being too high for export. The Dutch Iron dealers, for example, decline paying over 100 @ 103 marks ℔ ton for Merchant. Then the blast furnace owners have raised their prices of Pig, which the rolling mill owners complain of, although in reality in doing so they only followed their example. They are afraid of foreign competition abroad. The worst is that at a recent domestic adjudication lower tenders came from three firms

established in Germany, but not belonging to the syndicate. They are the Rhenish Steel Works, at Ruhrort; the Rothe Erde Steel Works, at Aix-la-Chapelle, and the Lieg-Rhenish Works, at Troisdorf. Some concerns have cleared big margins on their output during the last quarter—the Lawra, for example, 636,000 marks net on 4,930,203 marks disposed of. The Lawra turned out 32,000 tons of Iron and Steel during the quarter alluded to. Perhaps matters have in all directions been pushed too fast and too far in Germany, and, while domestic consumers may in a measure be compelled to subscribe to the advances dictated them, the export trade is beginning to make some bad experience, and prices for export are decidedly weak. *Metals*, in spite of the lower London quotations, have kept their ground remarkably well among us. We quote German Lead, 15.50 @ 16.25; Copper, 85; Spelter, 21 @ 22; Zinc, Gray, 20 @ 22; and Zinc, White, 21 @ 32.—*Borsenhalle.*

BELGIUM.

BRUSSELS, January 21, 1888.—*Iron.*—The Belgian Iron markets have continued displaying great animation. Shipments to Italy have gone on undisturbed. It should be remarked, however, that, taken as a whole, work by no means abounds, except for speedy delivery. Thus, there are a good many makers loaded down with orders for the first quarter of the new year, without a single one beyond it. Of course, all rolling mills owning their own blast furnaces are in better position than others not so situated. In the Liege Basin, for instance, nearly all make their own Pig, like, for example, Cockerill, Sclessin, l'Espérance and Grivegnée. The latter and Cockerill even have their own Coal mines. Pig Iron of both kinds remains quite scarce. In Charleroi two new blast furnaces for Puddling Pig are to be blown in. Foundry Pig remains scarce, but has not improved. Steel is rather neglected. Works are booked for a month or two, but beyond this adjudications will be welcome. There has been some discussion as to when the Bilbao Iron Ore mines are likely to be exhausted, and opinion is a good deal divided on the subject, something like 50,000,000 tons is the estimate of supply made by some parties, while others think there are 200,000,000 tons.—*Moniteur Industriel.*

RUSSIA.

ST. PETERSBURG, January 18, 1888.—*Petroleum.*—The Government has been for some time past in treaty with a syndicate headed by a Russian, Mr. Ilimoff, about a pipe line to be laid between Baku and Batoum. It is presumed the Rothschilds are at the bottom of this scheme, as they are known to have been more or less interested in Petroleum industry in the Caucasus for years past, having invested therein considerable amounts of money. Both the Minister of Finance and of Crownlands favor the plan, but the "Concessionnaires" ask for a privilege in connection with it objected to by others—*i. e.*, the export, duty free, for 60 years of Naphtha Residues. Mr. Nobel and consorts, who have invested millions in Tank Steamers, have petitioned Government not to grant such a concession, since it would ruin their business, the Naphtha Residues containing 75 % Oil.—*Journal de St. Petersbourg.*

FRANCE.

PARIS, January 21, 1888.—*Metals.*—The demand has revived by degrees at a decline in Copper and Lead, an advance in Spelter, and steadiness in Tin. We quote at the close in francs, ₱ 100 kg.: *Copper*, Chili Bars, 210 @ 215; Ingots and Slabs, 200; Best Selected, 205; *Tin*, Banca, 430; Billiton, 420; Straits, 440, and English, 385.50; *Lead*, 39 @ 40, and *Spelter*, 55.50 @ 57. *Iron.*—At length Parisian dealers have arrived at an understanding with Northern rolling-mill owners about a raising of prices, advancing Merchant from 14 to 14.50 francs ₱ 100 kg. In the North of France orders are dropping in steadily, the year having opened under favorable circumstances. The entire Iron and Steel branch in France is booking plenty of new commands, but there is still some complaint about prices not being remunerative enough. Meanwhile the Valenciennes meeting fixed Merchant at 14 francs.—*Moniteur des Interets Materiels.*

GREAT BRITAIN.

TIN PLATES.

Arthur Bird & Co., London, in their review of the Tin-Plate trade remark: "During the greater part of the past year the Tin-Plate works in this country had, in common with all other Iron and allied industries, great difficulty in obtaining remunerative prices for their manufactures. For about nine months pieces of raw material ruled comparatively high, demand was exceptionally sluggish, and prices realized showed little or no profit to the producer. The statistical position of the trade in January, 1887, as shown in our circular of that date, gave promise of better things, and as a matter of fact, Cokes, which then stood at the ruinous price of 12/9, did somewhat improve to 13/9, but consumers and dealers continued chary of buying anything beyond immediate and pressing requirements, and the market kept dull and lifeless. We give below our usual statistics, showing the present approximate power of production:

January, 1887.

	Mills.
Existing works, 83—representing	391
Standing idle.....	80
Total mills in operations.....	311
	Cwt.
Estimated productive power per annum.....	8,086,000

January, 1888.

	Mills.
Existing works, 87—representing.....	393
Standing idle...	43
Total mills in operation.....	350
	Cwt.
Estimated productive power per annum	9,130,000

Exports and Home Consumption.

	1885.	1886.	1887.
	Cwt.	Cwt.	Cwt.
Government export returns.....	5,954,560	6,695,500	7,095,460
Estimated home consumption of Tin and Black Plate.....	1,750,000	1,750,000	1,800,000
Total.....	7,704,560	8,445,500	8,895,460

During the last month or so the important advance in the price of foreign Tin had its effect upon the value of Tin Plates, and the trade for a short time showed more vitality and activity than for some years past. However, beyond raising the price to correspond with the enhanced value of metal the makers have felt but little benefit at present, consumers still refusing to buy beyond their current requirements, and dealers declining to lay in stock. As foreign Tin may now be considered to be at its maximum figure, the price of Tin Plates will probably not be further affected by it, at all events in an upward direction; producers must now depend more upon demand overtaking supply or an advance in the price of Iron and Steel. With regard to supply, our estimate of the production in 1888 shows some excess over previous years, but we cannot believe that this will be increased to any appreciable extent as the year goes on unless more margin is shown between raw and finished material. With regard to the demand, on which the future of the trade undoubtedly hinges, we have every hope that our exports will continue to show the same steady and sound increase that has been one of its most remarkable characteristics. We have no new competition in the manufacturing world to deal with; there are not wanting signs of expanding trade both at home and among our principal customers abroad, and stocks in dealers', consumers' and manufacturers' hands, not only in this but also in foreign countries, are unprecedentedly low. The position and prospects of the Hematite and Steel trades generally have much improved during the last month, and prices are expected to rise as the effect of our spring demand is felt. Should this expectation be realized, we cannot expect the price of Tin Plates to fall, and we might see a considerable rise without in any degree interfering with the ordinary consumption. At all events prices are now comparatively so moderate, and manufacturers' margin of profit so bare, that any realization of the above arguments in favor of a more active trade demand should at once bring about the improvement that has been so long and anxiously looked for.

THE IRON AND STEEL TRADES OF GREAT BRITAIN IN 1887.

(*From Annual Circular of W. Fallows & Co., Liverpool.*)

PIG IRON.—The output of the year was increased in consequence of the greater number of furnaces in blast. Between the months of January and August the number increased from 368 to 412, but afterward decreased to 404. We estimate the total production of the year at 7,250,000 tons. As might be expected, the production of Hematite Pig Iron (for Steel purposes) increased considerably, and it is not improbable the quantity would reach over 3,000,000 tons. The production, together with the total stocks in public stores and makers' hands, will be seen from the following table:

	1882. Tons.	1883. Tons.	1884. Tons.
Production.....	8,403,287	8,490,224	7,528,966
Total stocks....	1,595,120	1,663,976	1,809,467

	1885. Tons.	1886. Tons.	1887. Est. Tons.
Production.....	7,297,295	6,870,665	7,250,000
Total stocks....	2,352,169	2,491,506	2,750,000

These figures show that stocks have been steadily increasing for several years past; but what is perhaps more remarkable is the fact that this increase has been principally absorbed by the public in the form of warrants, the quantity in the makers' hands not being unusually large. Out of the present stock no less than 1,690,392 tons are held in the form of Pig Iron warrants.

The growing importance of the Steel trade is becoming more manifest every year. The following are the latest statistics on the subject, but, as previously stated, the output of Hematite Pig Iron has greatly increased during the year:

	1886. Tons.	1885. Tons.	1884. Tons.
Prod'n of Hematite Pig Iron..	2,600,000	2,560,000	2,770,000
Production of Steel Ingots..	2,264,000	1,888,047	1,774,926
Imports of Foreign Ores.....	2,875,176	2,817,597	2,728,672
Exports of Steel Rails.....	513,412	484,255	527,460

	1883. Tons.	1882. Tons.
Production of Hematite Pig Iron.....	3,287,000	3,425,000
Production of Steel Ingots.....	2,008,880	2,109,649
Imports of Foreign Ores..	3,178,310	3,282,496
Exports of Steel Rails....	754,108	734,959

The import of Foreign Ore in 1887 was 3,762,936 tons, and the export of Steel Rails was 755,707 tons. The greatest advance made during the year was in the direction of shipbuilding, and it is reported that 80 % of the whole tonnage is now built of Steel, and, these being steamers, the boilers are also made of the same material. The proportion of Tin Plates made from Steel is also increasing year by year, but the great bulk of Bars, Hoops and Sheets are still made of Puddled Iron. This continued growth in the consumption of Steel has drawn attention to the fact that the supply of Hematite Ores is comparatively limited, and although there may not be any immediate apprehension of supplies running short, still it is a fact which may come into play in the future. An advance in the price of Hematite Pigs would bring the Thomas-Gilchrist basic process into more general use in this country, more especially as Lloyds are now willing to allow Steel made by this process to be used in shipbuilding.

SHIPBUILDING, though very quiet during the greater portion of the year, experienced a very marked revival in November and December. It is estimated that the orders on the books of the shipbuilders at the close of the year would be nearly 600,000 tons, as against 379,902 tons on 31st of December, 1886. The tonnage built was as follows:

1887. Tons.	1886. Tons.	1885. Tons.	1884. Tons.	1883. Tons.
582,217	473,675	540,422	750,000	1,250,000

MANUFACTURED IRON AND STEEL were quiet and steady throughout the greater portion of the year, and it was only in December that higher prices were obtainable. Owing to the very active demand for Shipbuilding Plates and Angles, prices of Iron were advanced 15/ and Steel 25/ ₱ ton. Steel Rails not being in very active demand experienced but little change throughout the year, and prices only ranged between £4 and £4/5. Owing to the great advance in Spelter, Galvanized Sheets improved from £9/15 to £12 for 24 W.G. Bar Iron and Hoops were advanced 2/6 to 5/ ₱ ton at the close of the year; Sheet Iron being in exceptionately good demand advanced 10/ ₱ ton from the lowest point. In previous circulars we have referred to the severe competition experienced by English manufacturers through the active opposition of Continental makers in foreign markets, and the advantages the latter enjoy in the matter of rents, royalties and railway rates. This competition continues with undiminished severity, and in self-defense many works have been transferred to the seaboard, while others, in Staffordshire and Shropshire, have had to suspend operations in consequence of their inability to carry on the fight any longer. One works, writing to the secretary of The British Iron Trade Association, makes the following statement in lieu of statistical returns: "These works have been idle during the whole of 1886, owing mainly to the excessive railway charges for freight to the coast and home markets. Had we been working they might have carried 30,000 tons of materials, which both the railways and we have lost. One lot of about 10,000 tons of Finished Iron offered us went to Germany, and was carried over 280 miles for 5/4 ₱ ton, whereas the Great Western and London and Northwestern railways, both of which run into our works, would not carry the

same Iron for us 70 miles under 9/6 ₽ ton." It appears somewhat strange that, notwithstanding the great fall during the last ten years in the prices of Steel Rails and coals, little or no reduction has been made in rates which were fixed when prices were at least double those now ruling. The reduction effected in the cost of renewals through the enterprise of those connected with the Iron and Steel trades has all been absorbed by the railway companies, and without the slightest acknowledgment to those most interested and best entitled to participate in these benefits.

EXPORTS.—The following table shows the exports for the last five years, distinguishing those to the United States. Experience proves that this is the most powerful regulating element in the trade. Any marked advance in prices has always been coincident with large exports, and the course of the Iron trade during 1888 will very much depend on whether the late increase can be maintained or not. Twenty years ago our exports formed only 40 % of the whole production; now they are equal to 60 %, and the home trade, which was formerly the larger part, now only occupies a secondary position.

	1887. Tons.	1886. Tons.	1885. Tons.
Total exports of Iron and Steel..	4,146,907	3,388,494	3,128,418
To United States..	1,282,445	804,570	397,613
Total.....	2,864,462	2,583,924	2,730,795

	1884. Tons.	1883. Tons.
Total exports of Iron and Steel.....	3,496,352	4,044,273
To United States.....	454,804	696,949
Total.....	3,041,548	3,347,324

The Copper Situation.

(*From the Annual Report of James Lewis & Son, Liverpool.*)

Last year we considered the effect of the reduced value of Copper on production, showing that only the companies producing large quantities of Copper could do so to a profit at or under £40 ₽ ton. The average price of Chili Bar Copper for 1886 was £40. 10/, and the dividends declared were 3 % by the Rio Tinto Company, 2½ % by Mason & Barry, and 7½ % by the Tharsis Company. The average cost of production of the Calumet and Hecla Company is not stated, but that of five of the other Lake Superior companies averaged 8.36 ₽ lb. No dividend was declared by the Panulcillo Company, of Chili, or the Quebrada Company, but the Cape Copper Company made a profit of £46,186. Whether the Anaconda Company, of Montana, made any profit or not is not known; but the Parrot Company, of Montana, paid a dividend of $36,000 for the first six months of 1887; this, however, was probably largely due to the fact that their Copper Ore contains Silver of value.

We will now endeavor to show the probable effect of the present high prices on production.

Chili.—On the 31st December Bar Copper was quoted in Valparaiso $32.10 ₽ quintal, and exchange, 26⅛d, an advance of 2⅝d in the exchange, and of $15.95 in the value of Copper, as compared with 12 months previous. The shipments from Chili have been 6000 tons less than during 1886, and so far the increased value of Copper does not appear to have stimulated production. This decrease appears to be due to the greater inducements and higher wages offered at the recently discovered Gold and Silver mines, whither the miners had flocked. It will take some time to attract the miners back to the Copper mines, but that the owners will try to obtain and realize as much as possible of their produce at present prices cannot be doubted. Advices to hand to-day from Valparaiso state that "from all sides we hear that steps are being taken to work old mines."

Australia.—The same applies to this source of supply, where the great discoveries of Silver Lead Ore have diverted attention from the much more unprofitable mining of Copper.

Spain and Portugal.—Including the 3500 tons promised by the directors of the Rio Tinto Company, a further increase of at least 5000 tons may be expected from the three large Copper Pyrites mining companies. Endeavors will be made to justify the great advance in the value of the shares, and in the case of the companies that ship their Pyrites to this country to neutralize the important advance in freights.

Cape of Good Hope.—The shares of the Cape Copper Company have advanced from £23 to £48, representing £500,000. As the cost of production for 1886 was only 5/4 ₽ unit, the profit on the company's production of about 6000 tons of Fine Copper at 15/ or 16/ ₽ unit would be enormous—say £50 ₽ ton of Copper. The Namaqua Company expect to add 600 tons to their supply during 1888, as a dividend of 32 % is looked for with Copper at £60 ₽ ton.

Quebrada.—From this country we may look for an increased import this year.

Japan.—Part of the large falling off during 1887 will probably be made good in 1888.

Europe.—Copper Ore is being received again from Norway, and more is coming from Italy, while the Mansfeld Company, of Germany, will be able to resume the payments of dividends.

United States.—The high range of prices ruling will have most effect here, though, so far, they have been largely neutralized by the advance having come on the eve of winter, preventing the great increase that would otherwise have taken place in Montana, and by the fire in the Calumet and Hecla Mine at Lake Superior. The reduction caused by this latter will, however, be probably more than made good by the increased out-turn of the other Lake Superior mines, including the new Tamarack Mine, and the restarting of several that had ceased operations.

From *Montana* we expect an increased production this year of at least 20,000 tons over the 9000 tons increase of 1887, advantage having already been taken by some of the companies to sell part of their production up to the end of 1888 at prices that will leave a very good profit. The recently constituted Boston-Montana Company are at present producing about 1000 tons of 60 % Matte per month, and are expected before the year is finished to be turning out almost as much Copper as the famous Anaconda, the Mountain View Mine being very valuable and having large quantities of good Ore in sight, the richer portion of which is now being shipped without smelting. The Anaconda Company have recently put about 1200 tons of Ore daily through their concentrators, producing about 3500 tons of 60 % Matte per month in the furnaces; the Ore from the Anaconda and St. Lawerence mines is, however, becoming poorer in Copper as greater depth is reached. New works are in course of erection, but at present delayed by the winter, intended for the treatment of the Ore from the Chambers' group of mines recently acquired by the company, which contains about 7 % @ 8 % of Copper, and from them not less than 1000 tons per month of 50 % @ 55 % Matte is expected to be produced.

Arizona increased its production during 1887 nearly 1000 tons, and we may certainly look for a further increase of 2000 tons during 1888.

We, therefore, estimate that the total United States production, should Copper remain at or over £60 ₽ ton, will not be less than 105,000 tons of Fine Copper for 1888. As the production of the United States for 1887 was about 9000 tons over that of 1886, the exports 3000 tons greater, and the estimated stock on the 31st December 12,053 tons, against 6696 12 months previously, it would appear that the consumption has increased very slightly.

The production of the United States is estimated as follows, in tons Fine:

	1885	1886.	1887.
Lake Superior.....	32,209	35,593	33,304
Arizona.....	10,137	6,900	7,946
Montana.....	30,267	25,720	35,223
Other States and Territories.....	1,439	1,507	1,964
Total.....	74,052	69,810	78,437
Imported as Pyrites....	2,271	2,009	2,367
Total.....	76,323	71,819	80,804
The import during these years into England was.....	24,145	13,483	16,534
France was.....	9,235	4,167	3,910

The import into Liverpool was made up as follows:

	1885.	1886.	1887.
Ingots.....	1,509	320	35
Slabs.....	1,758	1,434	1,337
Precipitate.....	44	35	100
*Matte.....	18,851	10,818	14,939
*Ore.....	1,875	420	26
Total.....	24,037	13,027	16,437
*Including Anaconda..	14,726	8,974	12,982

From *Lower California* 1200 tons of Slab Copper has been shipped, but has not yet arrived. About two months ago the stock on hand at the Boleo mines consisted of about 100 tons of Slabs and 500 tons of 75 % Matte, the rate of production being about 12 tons of Matte daily. As no Copper was received from this quarter in 1887, this will be an increased supply during the present year.

Should, therefore, Copper remain for any length of time at or over £60 ₽ ton, and no combination be made for a limitation of production, we expect to see an increased supply to Europe during 1888 of probably 50,000 tons, it being borne in mind that the temporary stoppage of the Anaconda, Copper Queen and Calumet mines caused a deficiency in 1887 of about 10,000 tons.

Against this we may look for an increased consumption, both in Europe and the United States. In this country large orders have lately been given out for the building of steamships, the use of Copper Wire for electrical purposes is extending, trade is reviving, and there is increased activity in the manufacture of machinery and of sugar-producing plant. It remains to be seen to what extent the present high cost of Copper will diminish the ordinary consumption.

As the market is now entirely in the hands of the French syndicate, it is impossible to say what will be the immediate future of prices. The quantity of Copper which they now control is enormous, of one kind and another, their financial power appears very great, and if they continue to buy up all the Copper offered it rests with them for a time to say what the price shall be. No doubt efforts will be made to bring about combinations, both of producers and consumers, to keep up the price; but, unless some arrangements are made with the large producers to assist them, the longer the sale of the Copper they hold is deferred the more difficult it will be to realize and the more Copper will have ultimately to be realized by them.

We understand, however, that a proposition is now before the principal producers—the three Spanish, the Cape, the Anaconda, the Calumet and Hecla and the Panulcillo companies—not to increase their output, this being more than compensated to them by an understanding on the part of the syndicate that they shall not receive less than £60 ₽ ton for their Copper for three years, at which price several companies have already sold to the syndicate. The acceptance of this proposal by these companies would diminish the increased supply which would otherwise take place, to the extent, we consider, of about 15,000 tons, the additional increase being from the smaller producers, whom it will be difficult to combine and whose interest it will not be to limit their production, and also from the new Boston-Montana and Boleo companies. This additional increase, which we estimate at about 35,000 tons, may be absorbed by increased consumption without increasing stocks at the end of 1888 above the level of what they were a year ago.

Our statistics of the import of Copper produce into Liverpool, Swansea and London, and which represents the total imports in tons Fine Copper, with the exception of Precipitate, into Newcastle and Cardiff, reliable returns of which we cannot obtain, but which appears to vary from 8000 to 12,000 tons per annum, are:

	1885.	1886.	1887.
Chili.....	28,985	27,191	20,008
United States.....	24,145	13,483	16,534
Spain and Portugal....	4,655	5,721	5,178
" (Precipitate).....	9,186	10,038	13,042
" (Pyrites).....	16,333	13,905	14,940
Australia.....	8,951	10,096	6,047
Cape of Good Hope.....	5,405	7,073	8,271
Quebrada.....	4,074	3,055	2,261
Japan.....	3,010	3,572	200
Italy.....	835	902	1,055
Norway.....	27	....	....
Canada.....	....	8	94
Newfoundland.....	723	891	359
Mexico.....	374	243	61
Peru.....	229	68	13
River Plata.....	233	179	167
Other countries.....	217	496	1,074
Total.....	107,382	96,921	89,304
Import into France:			
Chili.....	6,357	8,257	9,011
United States.....	9,235	4,167	3,910
Other countries.....	995	1,600	1,048
Total.....	16,587	14,024	13,969
Total import into England and France.....	123,969	110,945	103,273
Export from Chili to all countries.....	38,636	35,138	*29,100

*Estimated.

A meeting was held at Madison, on the 24th ult., of the manufacturers of Central Wisconsin, the object being to consult and devise means for securing iron and coal at cheaper rates than at present by obtaining a reduction in transportation charges. A long and informal discussion was had, but nothing definite was done further than to resolve to form a manufacturers' club to secure the ends sought.

William Ward, a leading iron manufacturer and builder of furnaces in the Mahoning Valley, Ohio, died on Friday, the 27th ult., at his residence in Girard, Ohio, after an illness of a few days.

The Spanish Government proposes to celebrate the fourth centenary of the discovery of the New World, and to invite all the European and American Governments and learned Societies to send representatives to the ceremony.

A New Screw.

The American Screw Company, Providence, R. I., are preparing to put on the market a new screw, which is illustrated in the accompanying cut, Fig. 1. A representation of their present screw is also

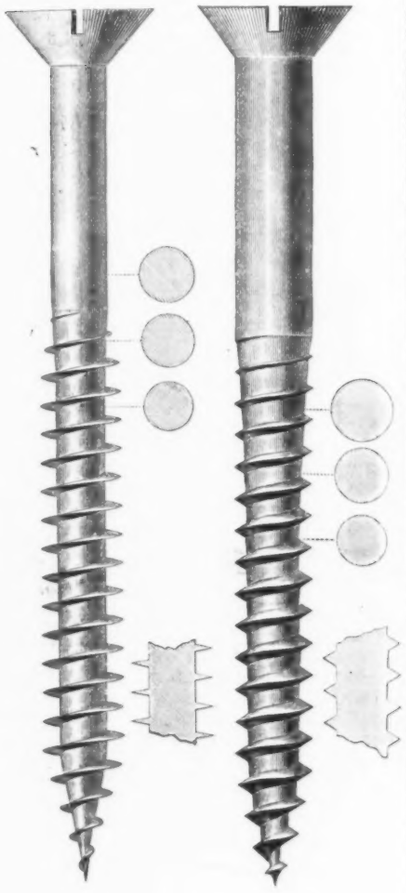


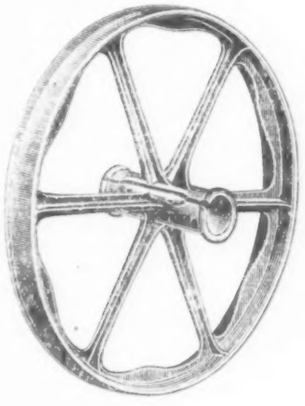
Fig. 1.—New Screw.

Fig. 2.—Present Style of Screw.

given in Fig. 2, in order to facilitate comparison between the new and the old styles. This new screw is based upon the patents of H. A. Harvey, covering the formation of the thread by the rolling or swaging process, these patents having been, however, supplemented since their purchase by the American Screw Company by the inventions of Chas. D. Rogers, the screw illustrated in Fig. 1 being the result. A comparison of the two illustrations will show that the principal differences in the patterns of the screws are in the form of the thread, the form of the points and the diameter of the shank as compared with the diameter of the thread. These differences, which are regarded by the company as embodying important advantages, are attainable, since the screw is made by rolling or swaging, instead of by cutting, as is the present method. The threads of the new screw are, it will be observed, very thin, as shown in the engraving of the screw, Fig. 1, and especially in the sectional view given. The advantage of this construction is that they enter the wood easily and without displacing as much of the wood as does the ordinary cut thread, and with much less driving force. The long and tapering point will also be observed, a feature which is referred to as attainable by the swaging process of manufacture, while in cutting screws there are difficulties in obtaining a point characterized by the same excellencies. One of the most important differences, however, in the new screw is the reduced diameter of the shank between the head and the commencement of the thread, doing away with the necessity of using two bits in hardwood to avoid splitting. It will be seen from the cut that the diameter of the shank of the screw is only slightly greater than the diameter of the core of the threaded portion, so that by using a single bit the exact diameter of the unthreaded portion the body of the screw will exactly fill the hole made by the bit, and the threaded portion will lie entirely in solid wood, into which the thread has entered, thus securing, it is claimed, a much firmer hold than is usually obtained, while the danger of splitting the wood is reduced to a minimum. It is also a point of interest that under the inventions of Mr. Rogers they are enabled to overcome what had been a difficulty under the Harvey process—namely, to make a head corresponding in size to the increased diameter of the thread. Besides the advantages thus gained in the form of the screw, we understand there is an important commercial advantage to the company in the manufacture of the new screw, as the enlargement of the diameter and head permits the manufacture of screws of a given size, from a smaller size of wire than is now possible, as, for example, we understand that a 2 inch No. 18 screw can be made from the same sized wire as a 2 inch No. 12 under the present method, and at a less cost, while bringing a materially advanced price. The trade will realize the interest and importance of the development of the screw manufacture thus announced. The company are preparing machinery for producing this new screw, but it will be understood that this will require an enormous equipment, and that some time must elapse before a complete line is put on the market. They regard the new inventions, however, as exceedingly important, and consider that they will occasion as great a revolution in screw making as occurred when the gimlet-pointed screw was re-introduced in 1849.

A New Wheelbarrow Wheel.

The Covert Manufacturing Company, West Troy, N. Y., are putting on the market the wheelbarrow wheel represented below. These wheels are described as made of the best malleable iron, with Bessemer steel axles, and have, as indicated in the cut, a split and flanged hub to facilitate putting in the axles. After the axles are placed in position in the hub the flange on each side of the opening is drawn

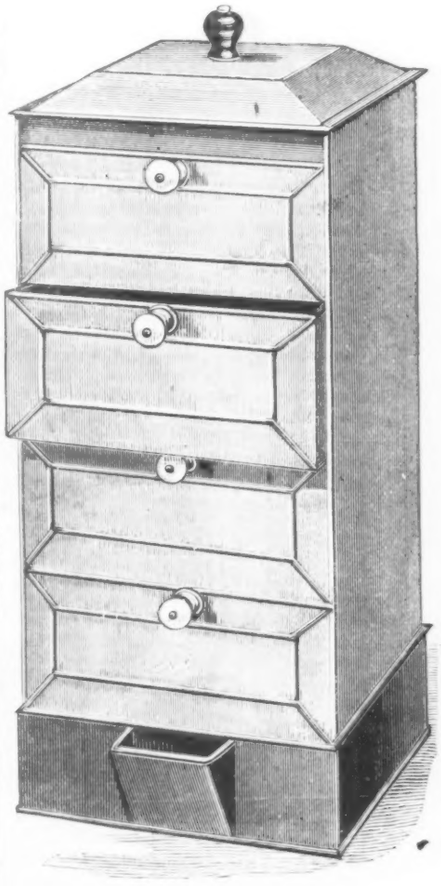


New Wheelbarrow Wheel.

together with bolts. These wheels are referred to as light, neat, and especially durable. They are made in two sizes, 16 and 21 inches diameter, and are furnished either ready for use or in parts as desired.

Brewington's Steam Cooker.

This article, which is illustrated herewith, is manufactured by H. S. Brewington & Co., Baltimore, Md., and is the invention of Mr. Brewington. It consists of a tank at the bottom which contains the water, and of a series of apartments in which the cooking is done. The tank or boiler for holding water is made of heavy planished copper, and is closed on all sides



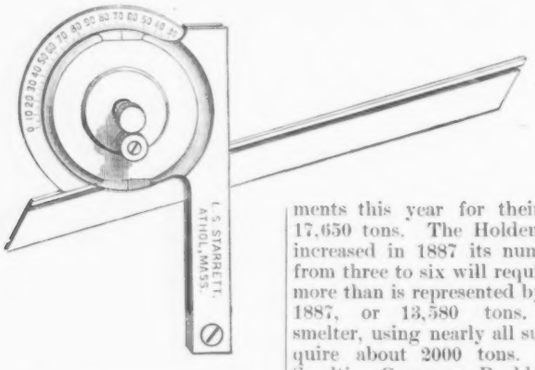
Brewington's New Steam Cooker.

except the front, where there is the opening shown in the illustration for filling and emptying, this opening being covered by a projecting lip. Connecting the tank with the cooking spaces above are four rectangular pipes, which fit into corresponding pipes running up the back of the cooker. One of these pipes supplies steam to the two upper drawers, and the lower ones each have one pipe. The fourth pipe is small and carries off condensed steam. The opening for filling the tank is near the bottom, and enough water must be kept in the tank to cover the opening to prevent the escape of steam. The body or upper part of the cooker is made of heavy tin, and consists of four shelves closed on all sides but the front, these shelves being connected at the back by valves with the steam pipes above referred to. Each shelf is separate and distinct from the others—a construction which is referred to as having peculiar advantages, as an article in one drawer cannot impart its flavor to those in the other drawers. The valves, by means of springs, are made self-closing, and have points about 2 inches long projecting forward, which are pushed back when the drawers are pushed in, thus opening the valves and admitting the steam. It will thus be seen that when it is desired not to use any given drawer the drawer is pulled out a short distance, and all the steam generated is devoted to those in use. The drawers are

slightly lower than the shelves to admit of the free circulation of steam, and are described as made like ordinary square pans with a stamped front made to fit closely over the edges of the shelves. The condensed steam is carried off by a small hole at the back of each shelf, opening into the escape-pipe mentioned above. This pipe leads down to a point below the surface of the water in the copper tank. The manufacturers allude to the convenience of this article and its satisfactory working. These cookers are made in four sizes—10 x 10, 11 x 11, 12 x 12 and 14 x 14—each size being furnished with 3, 4 or 5 drawers as desired, the 10 x 10 size being also made with only 2 drawers.

Universal Bevel Protractor.

L. S. Starrett, Athol, Mass., is putting on the market the bevel protractor illustrated in the cut given herewith. The blade of this tool is 7 inches by ½ inch, the stock 4 inches long, and both are made from sheet steel nicely finished. The disk, as shown in the illustration, is graduated in degrees from 0 to 90 each way, and rotates the entire circle on a central stud inside the case. The blade, which is clamped by an eccentric stud against the edge of the disk, may be slipped back and forth to its full length, or turned at any angle around the circle and firmly clamped at any point, adapting it for work in positions where others cannot be used, and rendering, it is said, the common universal bevel for transferring angles unnecessary. One side of the stock is made flat, making it a convenient tool for laying on paper in drafting, &c. The special utility of this tool is referred to by the manufacturers as particularly adapting it to the requirements of the trade.



Universal Bevel Protractor.

A meeting of the galvanized sheet-iron manufacturers was held at the Monongahela House, Pittsburgh, on Wednesday, the 25th ult., George F. McCleane, of the Moorhead-McCleane Company, of Pittsburgh, was chairman, and Charles R. Dallas, also of the above firm, acted as secretary. There were 16 firms represented from different parts of the country. The object of the meeting was to discuss matters of interest to the galvanized sheet-iron manufacturers, and also to discuss present prices. After a thorough interchange of views on the present situation it was decided to make no change whatever in prices. The question of forming an association, to be composed of all the sheet-iron manufacturers in the country, was also under discussion, but no action was taken. The report that the wage question was under discussion is incorrect, as this subject was not brought up. The meeting adjourned subject to the call of the secretary.

The Lead Supply to Colorado Smelters.

Mr. D. Bauman, editor of *Mine, Stack, and Rail*, of Denver, in a valuable article on the lead requirements of the smelting plants in Colorado, makes the following estimate of the lead contents of the ores which will go to these works:

	Tons.
Madonna, Eclipse and Silent Friend	12,000
Other mines of Monarch Garfield	1,500
Chalk Creek	1,720
La Plata District (Chaffee)	50
Cottonwood, &c	25
Total Chaffee	15,295
Fremont County may produce	200
Clear Creek, Boulder, Gilpin, Summit and Park counties	2,500
Eagle County	1,600
Custer County, Terrible Mine	2,500
" " other mines	100
Gunnison and San Juan	5,250
Pitkin County, Aspen and other districts	6,000
Thus lead output will not be less than	33,445
Colorado, total outside Lake County	33,445
Estimated importation, Territories and Mexico	14,000
Total, base bullion	47,445

Of this, about 18,000 tons will be in form of carbonate ore, about 6000 tons as clean galena, the rest requiring desulphurizing and in combination with more refractory minerals. We deduct from the 47,445 tons 12 per cent. for loss in reduction from ore to metal, leaving 41,700 tons. The bullion product of the Omaha and Grant in 1887 represents their requirements this year for their Denver plant 17,650 tons. The Holden smelter which increased in 1887 its number of furnaces from three to six will require 40 per cent. more than is represented by its product in 1887, or 13,580 tons. The Golden smelter, using nearly all sulphide, will require about 2000 tons. The Colorado Smelting Company, Pueblo, will want not less than 10,000 tons; the Pueblo Smelting Company, not less than 14,000 tons. If the Colorado smelter shall use more it will come from the Madonna mine above our estimate aforegiven.

We have thus as lead requirements for the Denver, Golden and Pueblo active plants, the following:

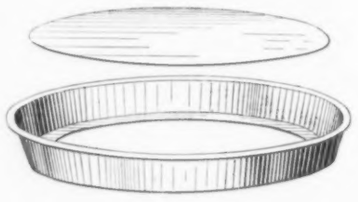
Omaha and Grant metallic tons	17,650
Holden	13,580
Golden	2,000
Pueblo S. and R. Co	14,000
Colorado S. Co	10,000
Total	57,235
Supplies exclusive of Leadville proper	47,445
Leaving short, tons metallic	9,888

This would have to come from Leadville. This is certainly not much, and as on all ore shipments from all other points than Leadville the mines pay the freight to Pueblo as well as Denver, one should suppose that the purchase of Leadville ore by valley smelters more than absolutely necessary is not advisable. This is the case in fact, but there are reasons why valley smelters cannot regulate their purchases in Leadville according to their inclinations.

Grading is in progress on the Duluth and Iron Range road between Tower, St. Louis County, Minn., and Chandler Mine, a distance of 21 miles. About 900 men are employed, and it is expected to have the roadbed for the entire distance ready for tracklaying by March 15, and to have the road completed for the opening of navigation for the ore shipment. It is stated that surveys are to be made at once for an extension of 15 miles east to Ely, Minn., which will be built in the spring.

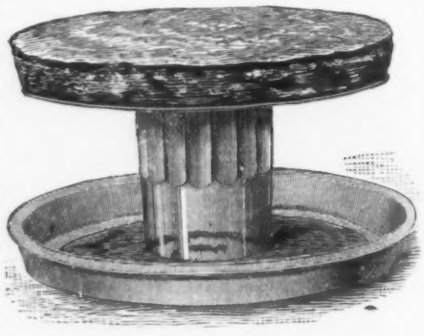
Perfection Cake and Pie Tin.

A decided novelty in pie plates and cake tins is being introduced by C. Sidney Sheppard & Co,, of Chicago, Ill. It is illustrated in the accompanying engravings, the first showing what the article is, and the second showing how it may be employed. Referring to the first, it will be noticed



Perfection Cake and Pie Tin.

that the pie plate is made in two parts. It consists of a rim flanged at the bottom, and over this flange a movable bottom. The bottom being movable is readily kept clean, and possesses advantages that will at once be perceived by any housewife. Pie plates and cake pans have been made in a variety of different ways before this, all having more or less reference to means of preventing the cake or pie from adhering to the metal, and facilitating the removal after baking. How removal is accomplished with the use of this utensil is illustrated in the second engraving. As the plate is taken from the oven it is allowed to rest upon a tumbler, or tin cup, or some other kitchen utensil, the cake or pie, as the case may be, remaining upon the bottom of the plate while the rim falls to the table. The makers direct attention to the following advantages, which are claimed for this article over the old-fashioned solid tins: The construction saves the necessity of coating or greasing papers for the bottom of the tin. It also allows the most delicate cake or pie to be removed, and that, too, without the slightest danger of breaking. They claim further that by reason of the separate bottom the cake or pie, as the case may be, never bakes too hard on the bottom. The edges of the cake are also true and even, thus building up a much nicer cake than is possible upon the old plan. Reference is also made to the plan of cooling illustrated in the second engraving presented herewith. At the same time the statement is made that the pie or cake can be cut and removed from the tin while hot, no matter how tender the crust, without danger of breaking.



Use of the Perfection Pie Tin, Showing How a Pie May be Cooled.

TRADE REPORT.

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, February 1, 1888.

There has been very little change in the Pig Iron markets the past week. Deliveries to consumers are on a scale of some magnitude, and the daily demand is very fair; but large stocks, heavy output and willing sellers operate to give the market a flat appearance. Most brands of Scotch Pig are again a shade lower, as is also Bessemer Pig. Spiegeleisen is higher and very firm.

The contrast in the Steel market is as marked at the present time as it was a fortnight ago. Not only is business brisker than in the Pig Iron market, but prices continue to show the reverse tendency, being very firm. The Rail market is strengthened materially by the fact that large orders are being placed by English railroad companies. It is stated that inquiries on Steel and Iron Slabs are coming in from the American market.

The report has circulation that a syndicate of German capitalists contemplates the erection of a large steel works in Scotland.

The dispute between the workmen and owners of the Northeastern Steel Works has been settled and operations at the mills are again going smoothly.

Some of the largest holders of Old Rails assert that there would be little or no difficulty in disposing of all the stock now on hand at present nominal prices. They claim that the available supply is moderate and concentrated in few hands.

The present indications are that the attempt to form a Tin-Plate syndicate is unlikely to result satisfactorily to the projectors of the scheme. In any event, several prominent makers who have been holding aloof since the movement was started, are still opposed to any of the several schemes presented. Some good orders for Plates from the American market have been placed recently. Reports late to-day are that the Plate makers are now starting a movement to restrict the production.

Information is, as yet, not forthcoming from trustworthy sources that would indicate that the Copper syndicate is making remarkably satisfactory progress with the negotiations with the Spanish mining companies. Rumors are plentiful, however, and keep the market in a ferment. The syndicate has been operating more actively in Tin and forced prices higher. Spelter is in more active demand from consumers.

Scotch Pig.—The market has continued slow, with prices in buyers favor.

No. 1 Coltness,	f.o.b.	Glasgow. 50/
No. 1 Summerlee,	"	" 50/6
No. 1 Gartsherrie,	"	" 47/
No. 1 Langloan,	"	" 49/
No. 1 Carnbroe,	"	" 43/6
No. 1 Shotts,	"	at Leith..... .....48/
No. 1 Glengarnock,	"	Ardrossan..... .....47/6
No. 1 Dalmellington,	"	" 43/6
No. 1 Eglinton	"	" 43/

Steamer freights, Glasgow to New York, 6/ @ 7/; Liverpool to New York, 7/6.

Cleveland Pig.—Market very quiet, but prices steady. No. 1 Middlesboro', G. M. B., 34/6; No. 3 do., 32/, f.o.b.

Bessemer Pig.—The demand slow and prices rather weak. West Coast brands, mixed numbers, 44/, f.o.b.

Spiegeleisen.—Demand fair and prices very firm. English 20 % quoted at 74/6 @ 75/, f.o.b.

Steel Rails.—The market firm with demand more active. Standard sections, £4. 2/6, f.o.b.

Steel Blooms.—Prices firm and the demand good. We quote at 75/ @ 77/6, f.o.b., for 7 x 7.

Steel Billets and Slabs.—The Market steady and demand fairly active. Bessemer 2½ x 2½ inch Billets, £4. 5/, and Nail Slabs, £4. 2/6, f.o.b.

Steel Wire Rods.—There is a fair trade at steady prices. Mild Steel, No. 6, quoted at £5. 17/6 @ £6, f.o.b.

Old Rails.—The market firm, with demand fair and offerings moderate. Tees quoted at £3 @ £3. 2/6, and Double Heads £3. 2/6 @ £3. 5/, c.i.f., New York.

Scrap Iron.—Very moderate demand. Prices nominal. Heavy Wrought at 47/6 @ 52/6, f.o.b.

Crop Ends.—Market quiet and unchanged. Bessemer quoted £2. 7/6, @ £2. 10/, f.o.b.

Tin Plate.—Business fair and prices without change. We quote, f.o.b. Liverpool:

IC Charcoal, Allaway grade	.....16/9 @ 17/6
IC Bessemer steel, Coke finish	.....14/9 @ 15/
IC Siemens " " "	.....15/3 @ 15/6
IC Coke, B. V. grade	.....14/9 @ 15/
Charcoal, Terne, Dean grade	.....13/9 @ 14/

Manufactured Iron.—The market is firm, with a good general demand. We quote, f.o.b. Liverpool:

	£	s.	d.		£	s.	d.
Staff. Ord. Marked Bars	7	10	0	@	7	12	6
" Common "	5	00	0	@	5	5	0
" Bl'k Sheet, singles	6	15	0	@	7	00	0
Welsh Bars (at Wales)	4	12	6	@	4	15	0

Tin.—Transactions unimportant. Prices still firmly held. Straits closed at £169, spot, and £145 @ £146, three months' futures.

Copper.—The market has been active and very irregular. Chili Bars closed at £76. 10/ @ £77; Best Selected, £81.

Lead.—Dull market, prices rather weak. Soft Spanish, £14. 5/ @ £14. 7/6.

Spelter.—The market firm, and more active. Silesian, ordinary, £20. 5/ @ £20. 10/.

Financial.

OFFICE OF THE IRON AGE,
WEDNESDAY EVENING, February 1, 1888.

Obstruction of transportation in the harbor and on land routes has retarded the movement of merchandise, and for the present general trade is comparatively dull, the volume of transactions showing a decline compared with the previous week, but values have been well maintained. The abundance of money, both in the home market and in England, is construed as a sign favorable to a liberal movement of merchandise at an early date. At the same time, political complications in Europe and warlike preparations by all the leading powers make it difficult to forecast the future. There are some signs that the coal miners' strike in Pennsylvania is nearing an end, as 10 collieries where there was lately entire suspension have partially resumed. At the same time it is manifest that the miners maintain a resolute front, and are attempting to involve the Wyoming region in the refusal to work. In the general market business is rather slow. Prices both of flour and grain favor the buyers. Cables are not encouraging to shippers. Corn is in light demand. Spot cotton is firm, with trading light. Respecting flour the *Mark Lane Express* says: "The increasing output of flour by American mills now forms a dominant factor in the world's breadstuff market." Provisions are inclined to droop, and in coffee there is a radical decline. The raw sugar market is demoralized by the trust, and importers are devising measures for self-protection preparatory to the busy season. Refined sugars are held at full prices.

The Stock Exchange markets have been more active and stronger. Through the entire week the coal shares have been most prominent, and advanced on reports of good earnings and better prospects. Lackawanna's official statement showed that about 12 % was earned on the capital stock last year, against 7¾ % in 1886, and Reading gained strength from a statement that a percentage of the income from coal sales would be set apart as a sinking fund. The favorable bank statement served to strengthen the market. The aggregate of transactions for the week is comparatively small, and at the close dullness is the chief characteristic.

The total clearings of 37 cities, for the week ended January 28, show a decrease of 13.8 %. Compared with the same week last year outside of New York the clearings are increased 5 %. As compared with the preceding week the clearings show a decrease of $46,479,404, of which $16,400,000 was at New York. Wichita reported a decrease of 62.1 %, New York 24.7, and Boston 1.5 %. Cheyenne increased 13.9. Philadelphia 7.3, St. Louis 1.4 and San Francisco 1.1 %. The falling off in the total was due to the extreme cold weather, which checked business.

The weekly bank statement showed an increase of $2,344,350 in surplus reserve, which brings that item up to $23,258,825, against $20,914,475 this time last year. In the total reserve there was a gain of $3,144,200, chiefly specie, but this was partly offset by an increase of $3,199,400 in deposits. Loans showed an expansion of $1,300,200. Currency has been returning very freely from the interior, and money has shown an easy tendency, with prospects of continuing so for some time to come. An explanation of easy money is found in diminished railroad construction, lessened speculative activity in Western land schemes and a reduced demand in the great manufacturing and industrial interests of the country. Hence a more general buying of bonds by corporations, and English investors are giving American investors more attention. In Chicago the demand for money is falling off, so that offers of capital are freely made at 6 %. The prosperity of the coal trade outside of the Lehigh and Schuylkill regions is shown by the annual reports of the Lackawanna and Delaware and Hudson companies. Despite the obstruction of transportation by heavy snow, railroad earnings as a rule are satisfactory. The Bank of England rate of discount remains unchanged. Not only in England, but in France and Germany the banks are accumulating specie. The Russian treasury is reported to have secured a loan in Amsterdam of $22,500,000 and the Hungarians have arranged for a loan of 29,000,000 florins from the Frankfort Rothschilds. Rates for money in New York are 4 @ 5 % for time loans. For commercial paper, the best named are 5 @ 5½ %. Discount remaining two to three months. The posted rates for bankers' sterling are $4.84 @ $4.87. The market is heavy.

According to the Custom House report the exports of specie from this port during the week were $570,000, making a total since January 1 of $1,509,000, against

$1,118,000 for the same time last year. The imports of specie were $151,000, and the total since January 1 is $387,000, as compared with $3,243,000 for the corresponding period in 1887.

The importations of merchandise at this port for the week were valued at $8,209,000. Since January 1 the total is $37,221,000, as compared with $32,932,000 for the same time last year, and $31,019,000 in 1886. The exports amounted to $5,028,454; total since January 1, $23,619,000, against $23,650,000 for the same time last year.

The statistics of the commerce of all the ports for the calendar year shows that for December alone there was an excess over imports of nearly $22,000,000, being the largest monthly difference since 1884. The exports amounting to $77,241,731, including $4,000,000 in specie, while the imports make a total of $55,401,909, including $3,301,729 in specie. Compared with December, 1886, there was a decline of $12,000,000 in exports and $14,000,000 in imports. The following is a comparison of the foreign commerce of this port for three years, ending December 31:

	1885.	1886	1887.
Total exports..	$732,947,547	$781,743,219	$752,110,370
Total imports..	629,286,702	721,961,835	770,469,224
Excess of imports.....			$18,358,854
Excess of exports.....	$103,660,845	$59,781,384	

The large excess of exports during the last two months has reduced the adverse balance of trade to less than $20,000,000 for the entire year. Up to the close of September the imports from January 1, 1887, exceeded the exports upward of $58,000,000.

The Chicago, St. Paul and Kansas City Railway Company announce that, beginning to-day, they will make through rates, based on a reduction of 40 ¢ on the higher classes and 10 ¢ on the lower classes in the tariff west of Chicago, from New York, Boston, Philadelphia and Baltimore, to St. Paul and Minneapolis by any and all of the trunk lines to Chicago. The "Soo" line issued its tariff from New York and New York points to St. Paul and Minneapolis, the same to take effect to-day, the figures giving the rates ₱ 100 lb as follows: First class, 90; second class, 80; third class, 61; fourth class, 47; fifth class, 40; sixth class, 34.

The Mechanics' and Traders Exchange elected Albert G. Bogert, president; Joseph R. Van Valen, vice-president; Gilbert J. Burnet, treasurer; Edmond A. Vaughn, secretary.

The status of American pottery having been called in question as related to foreign products, an American manufacturer and importer writes to say that the greater portion of the white crockery ware consumed to-day in the United States is furnished by the American potteries. This fact is the best evidence that these wares are equal to the same class of goods imported from England. In the higher class of decorated goods for table use the American potter holds no second place. The body of the ware is fully equal to the English; the shapes are generally superior and the decorations are better adapted to American tastes. In the highest and most expensive class of decorated table goods the American potter has not reached the attainments of his English competitor, but each succeeding year shows marked strides in that direction. There is abundant evidence that the exhibitions of the Museum of Art in 1875–80 gave an impulse to the commerce of this country in potteries and porcelains which led to vast changes in the trade and many improvements in American potteries, roused the taste of the people, and thus made America what it is—the best market in the world for the pottery products of all nations.

NEW YORK.

The Eastern Iron trade continues to be deeply affected by the Reading strike, the merits of which have been the subject of much unintelligent discussion in the daily newspapers. The heavy weather during the week has been unfavorable to any efforts to resume operations, but the signs of weakness among the men have continued to multiply. Very little has been accomplished as yet in the resumption of work either at individual collieries at the 8 ¢ advance or at Reading mines, nor is the situation clear as to the immediate future. It seems certain that the men in the Wyoming region will not enter into a "sympathetic" strike, and there are evidences of gathering discontent in the Schuylkill region itself. It would, however, be premature to conclude therefrom that there is a probability of an early abandonment of the contest by the men.

Iron Ore.—Importers of foreign Ore are weaker, and Rubio Bessemer, 53 to 57 ¢ Iron, is offered at 9¼¢ ₱ unit.

Pig Iron.—The situation is virtually unchanged in this market. Leading Lehigh makers have no Iron for sale so far as Foundry brands are concerned, while $16.50 is offered for good grades of Gray Forge at tidewater. Consumers display little or no anxiety, and business is practically at a standstill.

Bessemer Pig.—We hear of low offerings of Cornwall grades, with no business reported. The low sales of Bessemer Pig at Pittsburgh are attributed partly to the desire of leading manufacturers to depress the lake Ore market, the contracts for this year's supplies not having been made as yet.

Spiegeleisen.—The market for foreign is exceedingly dull, a number of Eastern rail mills reporting that their stocks purchased in 1887 are still quite sufficient to carry them far in 1888. Since the bulk of the Rail sales thus far have been made by Eastern works, there has been little covering thus far. Nominally 20 ¢ foreign Spiegeleisen is $27.50 @ $28.50.

Bar Iron.—We quote Common in carload lots on dock, 1.77½¢ @ 1.80¢; Medium, 1.80¢ @ 1.90¢, and Refined, 1.90¢ @ 1.95¢, half extras. Special brands are quoted 2.20¢ @ 2.50$.

Structural Iron.—We quote Bridge Plates, 2.10¢ @ 2.20¢; Angles, which are not being pressed for sale, 2.30¢ @ 2.40¢; Tees, 2.75¢ @ 2.90¢, all in round lots on dock, and Beams and Channels, 3.3¢.

Steel Rails.—In spite of statements to the contrary the purchases of the Pennsylvania Company have aggregated only 30,000 tons, as first announced, and not 50,000 tons, as reported in some quarters. The price was $31.50 at mill, which is a compromise between buyers' and sellers' views. The Pennsylvania Railroad will want a considerable additional quantity later on. In this market little has been heard thus far of the large orders said to be waiting for the placing of the Pennsylvania, the only sales reported being one lot of 10,000 to a Southwestern road, 10,000 tons to a trunk line, 1200 tons to a New England road, and a round lot to a Southern road, with unconfirmed reports of the closing of a 9000-ton order to a Canadian road for a New England extension. It is stated, and directly confirmed by some of them, that at least four Eastern mills have practically filled their first allotment. Outside of the Pennsylvania, Baltimore and Ohio, St. Paul and Duluth and the Chicago, Burlington and Quincy orders, aggregating about 60,000 tons, the Western mills have taken little business thus far. We quote $31.50 @ $32 at Eastern mill.

Wire Rods.—Importers report no business, the American mill taking what current Western orders there are. Foreign Rods are quoted, nominally, $40.50 @ $41.50.

Old Rails.—Outside of a few lots of Tees, two of them aggregating 600 tons, at $22, no business is reported. Mahoning Valley and Eastern Pennsylvania manufacturers are in the market, and the greater activity in Track Material will probably lead to additional inquiry for Old Rails. In the meantime holders are firm at $23 for Double Heads and upward. One lot of 1500 tons of Tees in the hands of bankers has been withdrawn, and a round price was refused for a large block of Tees.

Track Material.—A number of round orders have been placed, among them two blocks aggregating 10,000 kegs of Spikes, upward of 2000 tons of Angle Bars and over 400,000 Bolts and Nuts, with additional important business pending. We quote Spikes, $2.20 @ $2.25, delivered; Angle Bars, 1.85¢, at mill, and Bolts and Nuts 3.¢ @ 3.25¢.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,
PHILADELPHIA, PA., January 31, 1888.

Pig Iron.—The market is not materially changed from last week. There is very little good Iron for sale, and almost an equally light demand. Those who have anything to spare think they ought to get more money for it so as to offset the increased cost, but they have almost abandoned that idea, as consumers feel that they are in an almost equally bad position. Business at the moment is, therefore, more a matter of mutual accommodation than of ordinary purchase and sale. Sellers are supplying their customers so far as they can without any advance in prices, but, of course, are entering nothing for forward delivery, and have no expectation of keeping up to present arrangements for any length of time unless the coal strike is settled. The position is a most unfortunate one, therefore, from whatever standpoint it is regarded. If the strike continues the scarcity of Iron will be likely to unsettle values all through the country. Very few furnaces in this vicinity can continue to make Iron under present conditions. That may develop into a small sized famine scare in a little while, stocks on hand leaving only a very slight margin for protection against such a contingency. A settlement of the strike would be quite likely to reverse the operation. Instead of anxiety to buy, it would be anxiety to sell, and with an abundance of fuel consumers would be just as indifferent as they are now nervous and uneasy. There is no possible means of forming anything like a definite opinion in regard to the continuance of the strike, and without that opinions in regard to the course of the Iron trade would be equally futile. All that can be safely said, therefore, is that consumers have not suffered from scarcity so far. Ordinary sources of supply have been kept open with only very slight advances in prices, and these chiefly when parties were compelled to go a little outside. No. 1 Foundry, for instance, is $21 @ $21.50 and scarce, an advance of perhaps 50¢ per ton. No. 2 is practically unchanged at $19, but is firmer. Gray Forge is probably stronger than any other grade, $17.50 @ $18 asked for good iron, although some furnaces are still supplying their regular trade at about $17. Still the entire business is one of favor more than dollars and cents, although, as we said before, there must be a change soon, but in what direction time alone can show.

Blooms.—Sales of domestic Blooms at quoted rates; nothing doing in foreign, which are quoted about as follows: $31 @ $32 for Nail Slabs; $31.50 @ $32.50 for 4 x 4 Billets; $36 @ $38 for Siemens-Martin. Domestic Blooms as fol-

lows: Steel, from $30 to $35, f.o.b. cars at mill, according to analysis; Charcoal Blooms, $53 @ $54; Run-out Anthracite, $45 @ $46; Scrap Blooms, $38 @ $39 ₱ "bloom" ton.

Foreign Iron.—Nothing doing; prices are nominally as last quoted, viz., Bessemer, $20, c.i.f., duty paid; and 20 % Spiegel, at $28 @ 28.50, same terms.

Muck Bars.—Not much doing specially in ordinary qualities. Sales of the best qualities have been made at full quoted rates; others dull at inside figures, say $30 at mill; others up to $30.50 and $31.

Bar Iron.—There is no change of any importance; orders for small lots are sufficiently numerous to keep the mills pretty well employed, but they have very little ahead, so that the position is not altogether satisfactory. Prices, too, are very disappointing, cost of production having increased, while the selling price barely holds its own. Some of the mills seem to be a little ahead on car orders, but apart from that the demand is slow and dragging. Skelp Iron is also very dull, and while a great deal of stuff is likely to be wanted toward spring, consumers seem to be quite indifferent about placing orders now. Bars are quoted at from 1.9¢ to 2¢ for best makes; Grooved Skelp, 1.9 @ 1.95¢ and Sheared ditto at 2.1¢ @ 2.2¢. Business chiefly at inside figures.

Plate and Tank Iron.—Business moves along slowly and without any material change from last week. Some of the leading mills manage to run full, but a good many others are less fortunate, working half or three-quarter time, while a few are shut down entirely. The outlook is not specially encouraging, and only the best equipped and the best managed concerns are likely to do a paying business unless there is improvement both in price and demand. Quotations are about as follows for standard makes: Ordinary Plate, 2.15¢ @ 2.20¢; Tank, 2.20¢ @ 2.25¢; Shell, 2.6¢ @ 2.7¢; Flange, 3.5¢; Fire-Box, 4¢; Steel Plates, Tank and Ship Plate, 2.4¢ @ 2.5¢; Shell, 2.8¢; Flange, 3¢ @ 3¼¢; Fire-Box, 3¼¢ @ 4¼¢.

Structural Iron.—There is a good deal of work going on at mills, chiefly on old contracts, although there is a considerable demand for small lots for immediate delivery. Inquiries are numerous, and some appear to be for large lots, although they may not go through at present. The outlook in this department is good, and there is no reason to doubt that the mills will have all the work they can handle as spring approaches. Prices as last quoted, viz.: 2.25¢ @ 2.35¢ for Bridge Plate; 2.3¢ @ 2.35¢ for Angles; 2.8¢ @ 2.9¢ for Tees and 3.3¢ for Beams and Channels, Iron or Steel.

Sheet Iron.—Considering the season there is a very good demand, with some indications of a desire to buy large lots for summer delivery, providing that moderate concessions are granted. Manufacturers seem more disposed to take their own risks on deferred deliveries, although for spot lots prices can be shaded provided the order is large enough to make it an object. Small lots are quoted as follows:

Best Refined, Nos. 26, 27 and 28....	3½¢
Best Refined, Nos. 18 to 25	3¼¢
Common, ¼¢ less than the above.	
Best Bloom Sheets, Nos. 26 to 28....4½ @	4¾¢
Best Bloom Sheets, Nos. 22 to 25....4 @	4¼¢
Best Bloom Sheets, Nos. 16 to 21....3½ @	3¾¢
Blue Annealed.....2.8 @	3 ¢
Best Bloom, Galvanized, discount.....60	%
Common discount.....65	%

Steel Rails.—A great many inquiries have been made since the sales reported last week, but the amount of business closed is not important. Negotiations are still in progress, however, and it is thought that a good many lots will be taken in course of a few days. Meanwhile, prices are firmly held at $32 @ 33 at mill, with sales chiefly at the inside figure.

Railway Supplies.—There is not much demand at present, but prices are steady at 2¢ @ 2.1¢ for Fish Plates, and 3 @ 3.15¢ for Track Bolts.

Old Rails.—There is a continued good inquiry, but for some reason business fails to materialize in this direction, either because prices are lower elsewhere, or that consumers are postponing purchases in the hope that Rails will be lower soon. Lots in store are held at $23 for T's and $24 for D. H's, while shipments could probably be done at 50¢ @ $1 less. Buyers are very indifferent, however, and mention $21.50 for T's as about their ideas of value.

Scrap Iron.—There is an increasing scarcity of good Scrap, and anything at all desirable as to quality and delivery commands full prices, say about as follows: No. 1 Scrap, $21 @ $21.50; carload lots, $22 @ $22.50, or for choice lots $22.50 @ $23. No. 2 do., $14 @ $15; Turnings, $15 @ $16; Old Car-Wheels, $17.50 @ $18; Old Steel Rails, $20 @ $21; Cast Scrap, $16 @ $17; do. Borings, $11 @ $12; Old Fish Plates, $26 @ $27. Sale of Old Car-Wheels at $19, delivered.

Wrought-Iron Pipe.—The market remains in about the same condition as last reported. Prices are weak and unsatisfactory, and large buyers are able to obtain concessions without much difficulty. Discounts are as follows: Black Butt-Welded, 50 %; on Galvanized do., 42½ %; on Black Lap-Welded, 62½ %; on Galvanized do., 50 %; Boiler Tubes, 57½ %.

Nails.—A slight improvment is noticeable as regards the general position. While there is no advance to be recorded, yet there is a much firmer feeling, and a general disposition to make no concessions from prices now ruling, which are quoted at from $2.10 to $2.15

Pittsburgh.

Office of *The Iron Age*, 77 Fourth avenue,
PITTSBURGH, PA., January 31, 1888.

The general Iron market continues in an unsettled and unsatisfactory condition. Orders for Finished Iron are not coming forward very freely and the demand for the raw article is still of a hand-to-mouth character. The most serious drawback at present is the labor troubles, and the outlook for an early adjustment of the same is not as promising as it might be. Furnace owners very generally are asking for a reduction of 10 % in the cost of labor, while the men in some instances want an advance, but most of them insist upon the renewal of the scale of last year, which furnacemen, in view of the sharp decline in the price of their product, cannot pay. Other industries are having the same trouble. Manufacturers, owing to the recent sharp shrinkage in the value of their products, will have to reduce cost of production, and labor will have to come down with the rest.

It is probable, however, that the labor associations, when the matter is made so plain to them that they can no longer quibble, will come to terms, realizing that it is much better to accede to a reduction and have work than to refuse and be deprived of it; but it may take some time yet to straighten out these matters. A great many conferences will have to be held, and a good deal of time lost before the desired object is accomplished. River navigation continues suspended, to the detriment of general business, but this obstacle will likely be taken out of the way within the next week or two. The matter of transportation in these days of close margins is of great importance to our Iron and Steel manufacturers, and it is well known that freight can be transported cheaper by water than by rail. It is probable that large shipments will be made by river this spring, South and West, of Iron and Glass, as well as all kinds of Pittsburgh manufactures.

Pig Iron.—The past week showed no improvement; trade continues very dull, few consumers being disposed to buy beyond immediate actual wants, and the volume of business is exceedingly light in consequence. So far as the furnaceman is concerned the market is in an exceedingly unsatisfactory condition, more so than for several years, and it is evident that unless there is an improvement soon the number of idle furnaces in this district will be largely increased. Furnacemen say there is no money in business at present, and that unless the cost of production is reduced, or the price of Pig Iron advanced, the only alternative is to blow out, which, of course, they do not want to do. There is very little Iron offering from a distance, as furnace owners, both east and west of Pittsburgh, say they can do better at home than in this market. There was a rumor a few days ago of a further decline in the price of Coke, but this is denied by the Coke operators, who say they will resist any further reduction in price. However, as the Coke trade is very dull, and the demand is likely to be still more reduced by the blowing out of additional furnaces, the furnacemen may be successful in forcing a further reduction. The probability is that the furnacemen will succeed in getting a reduction of 10 % in labor, and if so there will doubtless be a corresponding reduction in the price of Coke, Ore, Limestone, &c. We quote as follows:

Neutral Gray Forge.....	$16.50 @	$17.00,	4 mos
All Ore Mill.	17.50 @	18.00	"
White and Mottled.	15.50 @	16.00	"
No. 1 Foundry.....	19.00 @	19.50	"
No. 2 Foundry....	18.00 @	18.50	"
Charcoal Foundry.... ..	24.00 @	26.00	"
Cold Blast Charcoal .....,	27.00 @	30.00	"
Bessemer Iron...	18.25 @	18.50	"

Bessemer Pig has been sold as low as $17.75, cash, delivered on cars at furnace, but there are not many sellers for standard brands under $18, cash, to $18.40 @ $18.50, four months. Several sales of Cold Blast Charcoal at $26 @ $27, cash. Foundry Irons are reported exceedingly dull.

Muck Bar—Continues dull and weak, and prices have further declined. We now quote at $28 @ $28.50, cash, with intimations that there have been sales below $28, cash.

Manufactured Iron.—The general position of the market remains unchanged; business is still reported slow, but very few of the mills are working up to their full capacity, and prices continue weak, in sympathy with raw material. We continue to quote Bars at 1.80¢ @ 1.90¢; Plates, 2.35¢ @ 2.40¢, and No. 24 Sheet, 2.85¢ @ 2.90¢, all 60 days, 2 % off for cash. Car builders continue to buy pretty freely, and it is probable that other large consumers will be on the market before long, although, as a matter of course, they will continue to buy sparingly as long as there is a probability of lower prices.

Nails.—Manufacturers continue to report business very slow. Prices remain unchanged at $2, 60 days, 2 % off for cash, with usual rebate of 10¢ ₱ keg on carloads and upward. The price is the same at Wheeling, and at all manufacturing points west of Pittsburgh.

Wrought-Iron Pipe.—There is no improvement to note in demand, and not likely to be until the spring trade opens up, which will not occur much, if any, before the 1st of March. As stated in this column some weeks ago, the combination prices are no longer adhered to, and the

market is in what is generally termed a go-as-you-please condition, each firm being free to make its own prices; hence for a desirable order, of which there are but few offering, rates would be cut very close. We continue to quote discounts as follows: On Black Butt-Welded Pipe, 50 %; on Galvanized do., 42½ %; on Black Lap-Welded, 62½ %; on Galvanized do., 50 %; Boiler Tubes, 57½ % off; Casing, all sizes, 52½ % off; 2-inch Tubing, 13¢ per foot net; 2-inch Line Pipe, 12¢ net.

Old Rails.—There are conflicting reports in regard to the Old Iron Rail market, and in the absence of sales it is difficult to give reliable quotations. The reports current in New York that Pittsburgh consumers are getting all they want at $24, cash, is, to say the least, a little mixed. One of the largest consumers here informs your correspondent that he was told by a broker that he thought he could get a lot of foreign Tees at $24.50, cash, delivered in Pittsburgh, but at present asking prices at seaboard, the cost delivered in Pittsburgh would be $24. However, there is but little inquiry, and consumers are impressed with the belief that in a few weeks more, when the hard-freezing weather is over, so that they can be lifted, Old American Rails will be offering pretty freely. At present there are few to be had. An Eastern party, who has a lot of foreign Tees in storage yards, is holding for $25, and refusing to accept anything less.

Steel Rails.—Heavy sections are still quoted at $32.50 @ $33, cash, at mill here. The Pennsylvania Railroad Company are reported as having contracted during the past week for some 30,000 tons, a part of which, it is understood, was awarded to Pittsburgh. The Homestead Works have resumed business, but the big mill at Braddock is still standing idle.

Billets, &c.—In regard to Bessemer Steel Billets reports are conflicting; some brokers report the market steady at $30, cash, with the mills in operation well sold up, while others intimate that they can be bought for less, especially for future delivery. For prompt delivery $30 may be regarded as the ruling price. There have been no sales reported for several weeks; the last one was at $29, cash, but whether they could now be bought at that price is doubtful. Crop Ends dull and lower; small sale reported at $18.75, cash; Bloom Ends usually 50¢ ℔ ton less than Crops.

Railway Track Supplies.—There is nothing doing, but an increased demand is looked for next month. Prices unchanged. Spikes, 2.60¢, 30 days, delivered; Splice-Bars, 1.90¢ @ 2¢; Track Bolts, 3¢ with square and 3.10¢ with hexagon nuts.

Old Material.—The demand for all kinds of Old Material continues light, while prices remain unchanged. No. 1 (Railroad) Wrought, $20, net ton; Wrought Turnings, $14; Car Axles, $26; Cast Scrap, $16.50 @ $17, gross; Cast Borings, $13, gross. There is no demand in this market for Old Car-Wheels. Sale of Crucible Leaf Spring Steel reported at $23, net ton.

Chicago.

Office of *The Iron Age*, 95 and 97 Washington St., Chicago, January 30, 1888.

Pig Iron.—The demand at present seems to be running toward the lower and cheaper grades of Coke Iron, caused to some extent by the scarcity of Scrap, which is usual during the winter. Some foundrymen also are using Silicon Pig, or Ferro-Silicon, the mixture of which in small quantities enables them to use low-grade Irons in making Soft Castings. Sales of foreign 10 %. Silicon Pig have been made in this market recently at $35 ℔ ton. Some inquiry for Lake Superior Charcoal is reported, but nothing has been accomplished in this line except in small lots for immediate use. There is a disposition on the part of large consumers to defer making contracts on account of the weakness in Coke Iron, which they expect will, in due time, spread to Charcoal. So far they have not been able to break down the price of the latter, which is still held at previous quotations. The lowest prices made during the week were for some brands of Southern Coke, although such Irons generally are held very closely to our quotations. Comparing the course of trade this month with January of last year, dealers unite in stating that general business has really varied very little, the chief difference consisting in the almost entire absence of sales of Bessemer Pig this year, whereas in January, 1886, heavy contracts were placed for that class of Iron. Cash quotations are as follows, f.o.b. Chicago: Lake Superior Charcoal, Nos. 1, 2 and 3, $22; Alabama Car-Wheel, $26; Southern Charcoal Foundry, $21 @ $22; Jackson County Softeners, No. 1, $21; Hocking Valley, Soft Foundry, No. 1, $20 @ $20.50; Hocking Valley, guaranteed Silicon, No. 1, $20.50; American Scotch, No. 1, $21 @ $21.50; Lake Superior Coke, all Ore, No. 1, $20 @ $21; No. 2, $19 @ $20; Cinder Mixed, 50¢ less; Coke Bessemer, run of furnace, $20 @ $21; Southern Coke, No. 2, $19 @ $19.75; No. 2½, $18.50.

Bar Iron.—Some good sales have been made during the week, and inquiries are still coming up. More orders for cars are on the carpet, which will involve further purchases of Iron, the requirements in that direction having been filled for the car orders already placed. Prices are no higher than they were, although agents of a number of mills report themselves out of the market at present. A disturbing element continues to be the Alabama mills, which are reported now as quoting 1.80¢, delivered at St. Paul, against a 30¢ rate of freight from Birmingham. Chicago quotations on mill orders for Common Iron range from 1.75¢ to 1.80¢, according to quantity, and 1.85¢ @ 2¢ for Muck Bar Iron, according to quality and specifications. Store prices are still 2¢ @ 2.2¢, according to quantity and quality.

Structural Iron.—A good order for bridge-work is in the market, and some nice specifications for building material have been entered. Prices on mill orders, f.o.b. Chicago, are as follows: Angles, 2.35¢ @ 2.40¢; Tees, 2.75¢; Universal Plates, 2.50¢ @ 2.60¢; Beams and Channels, 3.4¢. Store prices are $\frac{1}{10}$¢ @ ¼¢ higher than these rates. Orders for considerable quantities of Steel Car Truck Channels have been placed recently at prices ranging from 2.70¢ to 3¢, the lower figures being those now ruling.

Plates.—Business has been quiet. Store prices are as follows: Heavy Sheets, Nos. 10 to 14, 2.80¢; Tank Iron, 2.75¢; Tank Steel, 3¢; Shell Iron, 3.25¢; Shell Steel 3.50¢; Flange, 4¢; Fire-box, 4.75¢.

Sheet Iron.—The demand is very light for mill lots, an occasional order coming in from a large buyer whose stock is running low, or from consumers of special Sheets, such as trunk-makers. For this class of purchasers prices are on a basis of 3¢ @ 3.05¢, f.o.b. Chicago, for No. 27. Jobbers report a fair trade in progress at 3.50¢ for small lots of No. 27, with concessions for quantity.

Merchant Steel.—Manufacturers' representatives report some inquiry from jobbers for stock to meet the regular spring demand, but otherwise business is very quiet. Store prices are as follows: Bessemer Bars, 2.35¢ @ 2.50¢; Tool Steel, 8½¢ @ 9½¢; Specials, 13¢ @ 25¢; Crucible Spring, 4.25¢; Open-Hearth Spring, 3.30¢; Open-Hearth Machinery, 2.75¢ @ 3¢; Crucible Sheet Steel, 7¢ @ 11¢. Sales of Steel Nail Slabs have been made for delivery in this State at $31 @ $32.

Galvanized Iron.—Mill representatives have made sales of good round lots to heavy consumers. The small buyers are purchasing as freely as usual at this season. Quotations to the small trade continue on a basis of 60 % off for Juniata, and 60 % and 5 % off for Charcoal.

Steel Rails.—Although no sales of Rails have transpired during the past week the local manufacturers feel very much encouraged by the recent occurrences in the East, and an early increase in business is expected. A good demand for Light Steel Rails for lumbering is reported. The demand for such Rails for short pieces of track for a great variety of uses is also increasing. Prices are quoted at $35 for Standard Rails, about $40 for 30-lb Rails, and $45 for 10 to 12 lb.

Old Rails and Wheels.—The supply of Old Iron Rails is very limited just now, and holders are asking $22 @ $23, but no sales are reported, although a demand is indicated by the bids received. Old Steel Rails are worth $17 @ $18, as they run, but when selected command $19 @ $23, according to length. Old Car-Wheels are in demand, but no sales are reported. The nominal quotation is still $21.

Scrap.—The supply is growing smaller with the prevalence of winter weather, and dealers' prices are firmer. Sales of the lower grades of Iron Scrap were made during the week, but Forge was quiet. Dealers offer $14 @ $15 for Mixed Country Scrap. Quotations for carefully selected are as follows, ℔ ton of 2000 lb: Railroad Shop or No. 1 Forge, $21 @ $22; Track, $19 @ 20; Fish-plates, $20.50; Mill Iron or No. 1 Wrought, $16; Light Wrought, $9.50 @ $10.50; Machinery Cast, $16; Stove Plate, $12 @ $13; Cast Borings, $10 @ $10.25; Wrought Turnings, $12.75; Axle Turnings, $14.50; Coil Steel, $15; Leaf Steel, $16; Locomotive Tires, $17 @ $18; Mixed Steel Scrap, $12; Horseshoes, $19.50 @ $20; Axles, $26.

Nails.—A fair trade is reported from heavy buyers, and manufacturers' agents evince a better feeling, partly because they find their competitors sustaining prices and partly because with the nearer approach of spring they look for a still better demand than they have yet enjoyed. The Wheeling factories are reported to be holding their prices very firmly, while their Pittsburgh colleagues are considering the propriety of an advance. The demand is improving from the smaller class of buyers and carload orders increasing, owing to a general expectation in that quarter that prices will be higher. Jobbers' quotations are firm at $2.20 for small lots of Steel Cut Nails, and $2.90 for Wire Nails, with 10¢ off for carloads.

Barb Wire.—The recent advance has stimulated inquiries, and the small trade is purchasing more freely, while carload orders are not so scarce as they were. The full advance is not sustained, but both manufacturers and jobbers are asking higher prices and getting them. The regular quotation by jobbers is 3.35¢ @ 3.40¢ for Painted, and ¼¢ more for Galvanized, but concessions are made according to quantity.

General Hardware.—The business of the past week was very satisfactory. The snow blockade in the Northwest was raised, and both orders and money came in much more freely. The demand is now running principally on seasonable goods, Steel goods and Wire Cloth being the leading items after Nails and Barb Wire, but stocks of all kinds are light in the country, as is

shown by the general character of the orders now being received. There is some cutting in prices, which is usually the case in the spring before matters settle down to their regular place, but not more so now than ordinarily at this time of the year. The prospects for trade generally are still very encouraging.

Pig Lead.—Sales of 600 tons common Missouri are reported at 4.75¢. Small lots of Common have also been sold at 4.80¢ and Refined at 4.85¢ @ 4.90¢, February and March delivery. Argentiferous is still scarce.

The Zanesville Furnace of the Ohio Iron Company, at Zanesville, Ohio, has recently entered the Northwestern market through its agents, Rogers, Brown & Co., 98 Dearborn street, Chicago. This brand is one of the strong Ohio softeners which are in favor in this market, its peculiarity being an admixture of one-third Lake Champlain (New York) Ore.

Chattanooga.

Office of *The Iron Age*, Carter and Ninth Sts., CHATTANOOGA, TENN., January 30, 1888.

There is nothing particularly new to note in the way of general business, which appears to be moving along in a satisfactory manner. The lumber trade at the present time is showing great activity at this point, and it is estimated that something over 8,000,000 feet of logs have arrived at our wharves within the past two or three weeks. This lumber consists mostly of yellow poplar, with some black walnut, which is being cut up mostly for the Northern and Eastern markets. The amount so far received is but a fraction of what will come during the season. Agricultural Implement makers and dealers are now having their share of trade, as the farmers are now preparing to open up their farming operations, which will commence during the coming month. There appears to be no lack of new enterprises, and they are getting to be almost too common to even make a note of. A very important one, however, is about to take shape, which if carried out will add very materially to our manufacturing interests, and that is the erection of a large plant for the purpose of manufacturing gas for fuel purposes.

Pig Iron.—During the past week there has been an increased demand, or rather offers have been made by consumers in considerable excess of a week previous. The fact now exists among most of our Southern furnaces that some of them have sold fully up to their output for some months to come, and with others their output is not all of such quality as to meet the specifications of consumers. There are considerable lots of undesirable grades in some of the yards, which, when sold, may in some measure account for the reports that are made of conceded prices. At the present time there is no surplus of "Best" Irons in the Southern market, and round lots of such Iron would be hard to get, and for such the highest market prices are obtainable. Just at the present time the output of Iron South is being curtailed. The Chattanooga is out, but will soon go in. The Citico is out for at least 90 days, both being relined. In addition to these there are two others out and two or three others that will soon go out for repairs. The question of prices for the future is far from being settled in the minds of many of our largest producers. It is true that prices of our best grades of Foundry Iron are being fully maintained, and quite a number of sales are being made for immediate deliveries at some advance, yet the question is being discussed whether whether present prices will be maintained or even advanced, or whether prices will recede as the spring advances. It seems to hinge upon two questions—the action of Congress upon the tariff, and the continuation of the Reading Railroad strike.

Birmingham.

BIRMINGHAM, ALA., January 31, 1887.

Pig Iron.—There is not yet the demand that could be desired for Pig Iron, although the effect of the bear pressure of last month seems to be effectually broken. Several sales of 500 tons or less have been made in the last ten days, the better part of them to Eastern markets, but buyers generally are not yet disposed to make large contracts. Very little, if any, benefit so far is coming to this region from the Reading coal strike, which, it is expected, will affect the market if long continued. Prices are a little irregular, without any general movement either way. On the whole manufacturers would be very well satisfied with a guarantee of ruling prices as a permanent thing.

Finished Iron.—The bears still seem to have possession of the Bar Iron market. The demand is light and prices have gone down to about a 1.80¢ rate. The Light Sheet trade is almost at an end, too, for this season. In Corrugating Sheets and in Plates and Tank Iron there is a very satisfactory demand and prices are firm enough. The local corrugating concern is still getting its Iron from the North, because the home mills cannot supply it.

Miscellaneous.—A sensible increase of demand is reported in the Stove line in the last few weeks, and the local product, possibly because of greater confidence in the quality, commands better prices. The policy of the local manufacturers has undergone some revolution in favor of territory comparatively near home, a good part of their business with the far Southwest having resulted a little unsatisfactorily. Bolts and Nuts have been pretty badly hammered and now are far from commanding a premium. In the general run of small Ironwork a fairly satisfactory volume of business is doing.

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, January 31, 1888.

Pig Iron.—The conditions which influence trade in Pig Iron have been subject to but few changes during the week under review, and the transactions which have come to light do not indicate any change of moment in the views of either buyers or sellers, and while sales have been of less magnitude, it does not necessarily lead to a belief of either less or more confidence. There seems to be no lack of Iron to supply the consumption in progress, which is large, and yet furnaces cannot continue to sell their capacity for so many months ahead without making an impression upon the market, and if some producers are compelled to retire temporarily from the market it should rather strengthen the tone for those remaining. There has been a fair demand for Car-Wheel Iron, 1000 tons selling at $23.85, cash, here on Saturday, delivery extending through several months. There have also been sales for prompt delivery of 1000 tons No. 2 Coke Foundry Iron at $18.25, 1000 tons No. 1 Mill Iron at $17, and 1000 tons No. 2 Mill at $16.10; 500 tons Lake Superior Charcoal Iron sold at $22.50, cash, here. There have also been other sales of more or less moment at about the prevailing prices of last week. The prices current here at the close, on cash basis, f.o.b. cars Cincinnati, are as follows:

Hot-Blast Foundry.	
Ohio Southern Coke, No. 1	$19.50 @ $20.00
Ohio Southern Coke No. 2	18.00 @ 18.50
Ohio Southern Coke, No. 2½	17.50 @ 18.00
Ohio Soft Stone Coal, No. 1	19.50 @ 20.00
Ohio Soft Stone Coal, No. 2	18.00 @ 19.00
Mahoning Valley	20.00 @ 20.50
Hanging Rock, Charcoal, No. 1	22.00 @ 24.00
Hanging Rock Charcoal, No. 2	21.00 @ 23.00
Tennesse and Alabama, No. 1	20.00 @ 21.00
Tennessee and Alabama, No. 2	19.00 @ 20.00
Forge.	
Strong Neutral Coke	17.00 @ 17.50
Mottled Neutral Coke	15.50 @ 16.00
Cold Short	16.00 @ 17.00
Car-Wheel and Malleable Irons.	
Southern Car-Wheel	23.00 @ 24.00
Hanging Rock, Cold Blast	24.00 @ 25.00
Lake Superior Car-Wheel Malleable	22.50 @ 23.00

Old Rails and Wheels.—There has been a good demand for Old Wheels at $20, with moderate offerings at $20.50; but Old Rails have continued slow, with offerings at $21.50, and little demand at $21 ℔ ton.

Manufactured Iron.—There has been a quiet market, without essential change in prices, but there has been no pressure to sell, and the local mills are especially firm in their views, notwithstanding the active competition from outside sources.

Nails.—There has been a good demand and steady market for small amounts of both Iron and Steel Nails; 10d @ 60d sell at $2 @ $2.10 ℔ keg, and other sizes at proportionate rates. Steel Nails sell at $2.10 @ $2.20 and Steel Wire Nails $3 @ $3.10 ℔ keg.

Cleveland.

CLEVELAND, January 30, 1888.

Iron Ore.—The month of January comes to a close without a single ton of Ore having been sold for this season's delivery. By this time last year not less than 2,000,000 tons of Ore had been contracted for. If the railways remain firm in their proposition to pay no more than $30 for Rails during 1888, the Lake freights from Ashland must come down to $1.50, with the Escanaba rate not above $1. When the railroads place their orders for the season the furnacemen will begin buying Ore. No estimate of prices can yet be given, but buyers will not pay last season's rates.

Pig Iron.—The market lacks firmness. Current quotations are not maintained, and sales of the best grades of Foundry Iron are reported at figures below $19, at the furnace, four months. Large manufacturers say that the small furnaces are responsible for the demoralization of the market. Having great quantities of Ore on hand they must convert it into Iron even if sales must be made at a loss. Until these sacrifice sales are completed the furnaces doing a large business will either keep out of the market or blow out. There is an increasing demand for the raw material, and orders for standard or special brands are reported to be quite numerous. Just as the month closes orders for Lake Superior Charcoal are reported, indicating that the railway men are after Wheel Iron. Orders from the Northwest for Ohio Irons are also reported, but buyers nowhere seem inclined toward liberal purchases. Lake Superior Charcoal, all grades, f.o.b. cars, Cleveland, four months, are quoted $21.50 @ $23; No. 1 Bessemer, $20.85; No. 1 Foundry, all Lake Ores, $20.35 @ $20.85; No. 2 Foundry, all Lake Ores, $19.35 @ $19.85; No. 1 Foundry, Lake Ores, with cinder mixture, $19.85 @ $20.35; No. 2 same, $18.85 @ $19.35; No. 1 Silvery, native Ohio Ores, $20 @ $20.50; No. 2 same, $19 @ $19.50; No. 1, Gray Forge, Red Short, $19.35 @ $19.85; No. 1 American Scotch, $20.50.

Sheet Iron.—Manufacturers and jobbers do not look for much business until the middle of May. Prices are quoted on a basis of $2.75 for No. 24.

Nails.—Prices at the mill are $1.85 for Iron and $1.95 for Steel Cut Nails in 1000-keg lots. Jobbers are again asking $2 for Iron and $2.10 for Steel Nails.

Old Rails and Wheels.—No transactions of any value are reported, and the market is counted very weak.

Manufactured Iron.—Large orders are being placed by car works, and Bar Iron is fairly firm at $1.70, with a prospect of

$1.80 being paid before the close of the week. This is quite a rally from a lifeless market, with forced sales at $1.60.

St. Louis.

ST. LOUIS, January 30, 1888.

Pig Iron.—The market is feeling the depressing effect of the quantities of Bessemer Iron being offered since the Rail mills all over the country have been closed down. Inquiries are coming in freely, and a good many orders are being placed, though at prices lower than were considered two weeks ago. There are no large stocks on hand either at the foundries and furnaces, though the fear that stocks will accumulate causes a strong competition which generally results in quotations being reduced 25¢ @ 50¢. Southern Mill and Bright Irons are in good request, and most furnaces are sold for 60 to 90 days ahead on these grades. We quote for cash on cars East St. Louis as follows:

Charcoal Foundry.			
Missouri	$19.00	@	$20.00
Southern	19.00	@	20.00
Coal and Coke Irons.			
Southern	18.50	@	19.00
Ohio Softeners	20.50	@	23.00
Mill Iron.			
Southern	17.00	@	18.00
Car-Wheel and Malleable Irons.			
Southern	21.00	@	24.00
Lake Superior	22.50	@	23.50

Old Rails and Wheels.—Inquiries are coming in more freely. Wheels are quoted at $20.50, cash, on the cars East St. Louis. Rails can be bought at $22 @ $22.25 ₱ ton.

Scrap.—Stove Plate is offered at 45¢ @ 47½¢. Machinery No. 1, 60¢ @ 75¢. Connellsville Coke, $5.85.

Louisville.

LOUISVILLE, KY., January 30, 1888.

There has been very little buying of Iron at Louisville during the past week, but inquiries from the outside are numerous, and show that there are a large number of buyers who will make heavy purchases the moment they feel that the market has reached bottom. It is evident, from the trouble that is found in getting Irons from furnaces for delivery during the next four months, that if the foundries needing Iron expect to obtain it from furnaces in the South it will be impossible to supply their wants, as the Irons, especially Mill grades, have been sold ahead largely, and in many instances where it was thought there would be no trouble in getting all the Iron desired, it was found that it could not be furnished even at satisfactory prices. There is in this desire for Iron the elements of an advance, and it will not be surprising if the market shows a slight upward tendency at the beginning of the week. Iron has been sold very low by some furnaces, but the most desirable Irons are held firm, and higher prices will be asked very soon if the demand lasts a few days longer. Current quotations:

Southern Coke, No. 1 Foundry	$18.50	@	$19.50
" No. 2 "	17.50	@	18.50
" No. 2½ "	17.00	@	18.00
Hanging Rock, Coke, No. 1 Foundry	19.00	@	20.00
Hanging Rock, Charcoal, No. 1 Foundry	22.50	@	24.00
Southern Charcoal, No. 1 Foundry	19.50	@	20.50
Silver Gray different grades	16.00	@	17.00
Southern Coke, No. 1 Mill, Neutral	16.00	@	17.00
" No. 2 " "	15.50	@	16.50
" No. 1 " Cold Short	15.50	@	16.50
White and Mottled, different grades	15.00	@	16.00
Southern Car-Wheel, standard brands	23.00	@	24.00
Southern Car-Wheel, other brands	20.00	@	21.00
Hanging Rock, Cold Blast	24.00	@	25.00
Hanging Rock, Warm Blast	20.00	@	21.00

Detroit.

CHARLES HIMROD & Co., dealers in Iron, Detroit, Mich., report, under date of January 30, 1888, as follows: There has been a little less buying done during the past week for local consumption than for some time past, but we learn of large sales having been made in other parts of the country for Iron made in this district, Lake Superior Charcoal, and not alone for this Iron, but for nearly all kinds; prices on all ruling firm, with the exception of Northern-made Coke Iron, which has weakened considerably, the weakness being mainly caused by the increased supply which has sprung up on account of the comparatively small call for Bessemer. We think, however, that the recent very large orders for cars would indicate an extension in the railroad business of the country to such a degree that the demand for Steel Rails may possibly also increase in proportion, when more of the furnaces would be turned on to making Bessemer Pig again, and, of course, the supply of Foundry Iron would be made shorter. The large demand for Lake Superior Charcoal Iron existing at the present time, which will be augmented by the requirements of those consumers who buy their year's supply during the summer months, and who use so largely of Lake Superior Iron, should certainly have the effect of putting values on a higher basis. We quote the market as follows:

Lake Superior Charcoal, all numbers	$22.00	@	$23.00
Lake Superior Coke, All Ore	21.25	@	21.75
Lake Superior Coke, Cinder Mixed	19.00	@	20.00
Standard Ohio Blackband	21.50	@	22.00
Southern No. 2	19.50	@	20.00
Southern Silvery	18.50	@	19.00
Jackson County, Ohio, Silvery	20.50	@	21.00
American Old Iron Rails	25.00	@	26.00
Old Wheels	21.00	@	22.00

Coal Market.

The Anthracite Coal trade is in a critical state pending a settlement of the miners' strike, which may be near at hand, or possibly be protracted for some time to come. Meanwhile there is no activity beyond the supply of urgent necessities, consumers standing aloof to await events, and dealers fearing to buy at the prevailing high prices. The contracts by corporations and other heavy buyers, usually looked for at this season, are yet in abeyance. Some reports just received from the Schuylkill region are of a more hopeful tenor, the strikers being scarcely able to restrain the hungry men who are eager to go to work, notably at the William Penn colliery and at Kehley Run. At the office of Pardee & Co. and Coxe Bros. in this city there is nothing new to report. The Pennsylvania Coal Company have been much obstructed by difficulties in transportation At the Delaware & Hudson Company's office everything is favorable to a continued heavy output in the Wyoming region, where there are no grievances and no signs of discontent. The miners, it is confidently predicted, cannot be induced to quit, for one reason that they can help the strikers elsewhere more by contributing from their earnings than in any other way.

In the New York market Coal is plenty, but there is no accumulation and no pressure to buy. Quotations for Anthracite are unchanged—viz.: Stove, $5 @ 5.25 alongside; Chestnut, $5.50; Pea, f.o.b., $3.50 @ $3.60; Lehigh and Wilkesbarre are quoted f.o.b. net as follows: Broken, $4.15; Egg, $4.30; Stove, $4.75; Chestnut, $4.75. Pea and Buckwheat are very scarce. Chestnut is in moderate supply.

Bituminous Coal is stiff at $3.50 alongside in New York. Transportation is now unobstructed.

The statistical position of Anthracite is less favorable, on account of severe weather in the mining regions, but the total output for the week ending January 28 is 447,464 tons, against 606,114 tons for the corresponding week last year, and the aggregate since January 1 is 2,166,351 tons, as compared with 2,218,205 tons for the same time in 1887, a decrease of 52,000 tons. Wyoming produced 385,000 tons; Lehigh, 37,500; Schuylkill, 25,000 tons. Three days of lost time during the week fully accounts for the decline. Ten colleries in the Schuylkill region are understood to be working, though on a limited scale.

A statement of the Cumberland Coal production for the year 1887 shows that the total output was 3,375,796 tons, an increase of 783,331 tons over the year 1886. The largest producer was the Consolidation Coal Company, with 936,799 tons. George's Creek is next with 394,000 tons. The New Central Company reports 182,000 tons. Of the aggregate, 389,000 tons were shipped over the Pennsylvania Railroad and 2,597,000 over the Baltimore and Ohio. This trade has sprung up within the last 50 years.

Imports.

The imports of Iron and Steel, Hardware, &c., at this port from January 21 to January 28, inclusive, and from January 1 to January 28, inclusive, were as follows:

Iron and Steel.

	Jan. 21 to Jan. 28. Tons.	Jan. 1 to Jan. 28. Tons.
Iron Ore: Naylor & Co	349	349
Pig Iron: Crocker Bros	100	900
N. S. Bartlett	100	800
Steel: W. F. Wagner	38	123
C. Hugill	11	35
Newton & S	4	17
Spiegeleisen: Crocker Bros	123	123
Geisenheimer & Co	30	30
Steel Rods: Naylor & Co	704	1,536
A. Milne & Co	400	935
A. Heyn	40	190
J. S. Leng	17	17
Montgomery & Co	10	35
R. H. Wolff & Co	5	469
Iron: J. Abbott & Co	26	611
Steel Sheets: Naylor & Co	10	21
Steel Bars: Hondolette D. & Co.	43	43
Steel Forgings: Thos. Prosser & Son	207	299
C. W. Power	20	20
Rivet Rods: J. Abbott & Co	109	220
Washburn Mfg. Co	35	35
Iron Rods: Naylor & Co	50	100
Iron Wire Rods: J. A. Roebling's Sons	151	151
Sheet Iron: T. B. Coddington & Co	30	174
Swede Iron: J. Abbott & Co.	202	202
Old Fish Plates: Neumark & Gross	40	40

Tin Plates.

	Boxes.	Boxes.
T. B. Coddington & Co	2,461	12,504
H. R. De Milt & Co	1,001	1,651
Bruce & Cook	500	5,867
N. L. Cort & Co	399	10,727
Dickerson, Van Duzen & Co	340	25,928
R. Crooks & Co	225	3,617

Metals.

	Pounds.	Pounds.
Tin: J. Abbott & Co	30,688	1,102,405
Hendricks Bros	28,327	57,158
Phelps Dodge & Co	1,743	56,394
Nickel: McCoy & Sanders	5,000	20,000
Spelter: American Metal Co	111,034	166,149
	Casks.	Casks.
Antimony: Phelps, Dodge & Co	50	120

Hardware, Machinery, &c.

Alexandre, F. & Sons, Guns, cs., 4
Baldwin Bros. & Co., Gun Barrels, cs., 6
Boker, Carl F., Mdse. cs., 6
Boker, Hermann & Co., Ironware, &c., cs., 28
Castle, S. A. & Co., Hdw., cs., 9
Dieckerhoff, Raefloer & Co., Machinery, cs., 21
Field, Alfred & Co., Arms, cs., 7
Foley, E., Mach'y, pkgs 16
Graef Cutlery Co., Cutlery, cs. 6; Hdw., case, 1
Gould, R. S., Brass Foundry, case, 1
Hart, A. H. & Co., Mach'y, cs., 2
Kastor, A., Mdse., cs., 4
Keuler, John J. & Co., Mach'y, case, 1
King, Hezekiah, Hdw., pkgs., 180
Lau, J. H. & Co., Cutlery, cs., 3
Liera, J., Mach'y, pkgs., 2
McCoy & Sanders, Hdw., pkgs., 6
Montgomery & Co., hardware, pkgs., 3
Rosenthal, J., Hdw., cs., 5
Schwarzenback, Huber & Co., Mach'y, cs. 13
Schoverling, A., Arms, cs., 11
The Solvay Progress Company, Mach'y, cs., 2
Uhlmann, S. & F., Mach'y, pkgs., 70
Voght, J. H. & Co., Mach'y, cs., 2
Wiebusch & Hilger, Hdw., cs., 6; Mdse., cs., 6
Witte, John G. & Bro., Cutlery, cs., 7; Guns, case., 1
Wright, Peter & Sons, Mach'y, pkgs., 11
Order: Steelware, pcs., 300; Iron work, cs., 4

Irons and Metals Warehoused from January 21 to January 28, inclusive:

	Tons.
Old Rails: M. Frankfort	100

Exports.

The following table presents the exports of Hardware, Iron, Steel, Metals, &c., from the port of New York for the week ending January 31, 1888:

	Quan.	Val.
Argentine Republic		
Ag.imp., pkgs	823	$23,084
Sew. ma. cs	13	315
Cartridges, cse	1	25
Nails, cs	68	480
Hdw., cs	126	3,237
Brass goods, cases	2	385
W. mills, pkgs	59	1,958
Clocks, pkgs	21	687
Cutlery, cs	51	1,361
Firearms, cs	7	1,108
Washing machines cs	1	49
Alexandria.		
Mach'y, pkgs	3	47
Antwerp.		
Firearms, cs	4	776
Sew.ma., cs	76	906
Hdw.,pkgs	70	2,490
Ag.imp., pkgs	4	359
Forges, cs	19	200
Africa.		
Clocks, pkge	25	568
Budapest.		
Pumps, pkgs	7	318
Berlin		
Hdw., cs	6	150
Mach'y, pkgs	2	350
British Australia.		
Mch'y, pkge	1	40
Sew. ma., cs	27	602
Ag. imp., pkge	8	120
Carriages pgs	34	1,348
Hdw., pkgs	84	977
Mf. iron, pkgs	10	108
Bradford.		
Iron frames	6	60
Bristol.		
Mchy., pkgs	7	225
Bremen.		
Machy., pkgs.	5	200
Sew ma., cs	4	200
Mf. iron, pkgs.	5	195
Cutlery, cs	1	115
Bilbao.		
Mach'y, pkge.	2	56
British East Indies.		
Clocks, cs	212	3,333
British West Indies.		
Pumps, pkge.	1	47
Nails, kegs	139	377
Mach'y, pkge	1	16
Sew. ma., cs	50	1,155
Cog wheel	1	233
Anchors	12	71
Mf. iron, pkgs	77	464
Scales, cs	14	204
Hdw., pkgs	81	808
Ag. imp., pkgs	7	85
Tinware, cs	20	219
Nails, pkgs	2	49
Clocks, cse	1	27
Brazil.		
Clocks, cs	45	1,524
Ag.imp., pkgs	367	2,814
Iron, cs	200	1,215
Pumps, pkgs	2	39
Agateware, cs	5	92
Cutlery, cs	135	1,338
Mf. iron, pkgs	282	3,110
Boiler	1	1,800
Lamp goods, pkgs	48	1,007
Hdw., pkgs	287	2,514
Mach'y, pkgs.	11	1,000
Tacks, cs	4	22
Chile.		
Mf. iron, pkge	1	6
Hdw., pkgs	16	456
Saw Teeth, cse	1	127
Charkow.		
Ag.imp., pkgs	38	2,752
Cuba.		
Brass g'ds, cs.	4	157
Saws, cs	4	251
Mach'y, pkgs.	508	18,292
Cutlery, cs	47	890
Hdw., pkgs	168	2,593
Lead, pigs	28	113
Boiler	1	3,900
Steel, pkgs	5	115
Pumps, pkgs.	28	3,456
Agl.imp.pkgs.	4	113
Clocks, cs	21	599
Copper, coils.	4	760
Railroad cars	6	1,740
Wire goods, pkgs	11	289
Windmills, cs.	3	30
Nails, pkgs	27	261
Mf.iron. p'gs.	1,886	10,272
Spikes, kegs.	420	1 323
Sugar Wag'ns	30	430
Nails, kegs	1,883	3,918
Sew. ma., cs.	35	747
Cartridges, cs	4	84
Copper tubes, cs.	8	1,037
Windmill	4	107
Car wheels	10	70
Central America.		
Mf.iron, pkgs.	201	1,631
Ag.imp. pkgs.	11	139
Cutlery, cs	13	299
Nails, cs	4	18
Nails, kegs	5	36
Cartridges, cs	7	119
Brass goods, cs	2	64
Tinware, cs	4	86
Zinc, cask	1	42
Steel, pcs	10	188
Pumps, pkge.	1	23
Hdw., pkgs	81	951
Firearms, cs.	5	393
Saws, cs	2	51
Sew. ma., cs.	20	361
Clocks, cs	5	132
Mach'y, pkgs.	9	201
Tacks, cs	10	84
Dundee.		
Sew. ma., cs.	3	200
Danish West Indies.		
Nails, kegs	5	15
Hdw., cs	7	49
Dutch East Indies.		
Hdw., case	1	56
Dublin.		
Agl imp., pgs.	10	91
Dutch West Indies.		
Hdw., pkgs	19	85
Sew. ma., cse	1	8
Print'g press pkgs	14	1,250
Ecuador.		
Cutlery, cs	22	402
Sew. mach.,cs	5	160
Firearms, cs.	2	127
Hdw., cs	46	1,205
Mf.iron, pkgs.	10	53
Pumps, pkgs.	2	89
Cartridges, cs.	2	36
Flensborg.		
Hdw., case	1	65
French West Indies.		
Mf. iron, pkgs	32	144
Sew. mach.,cs	5	130
Glasgow.		
Sew. mach,,cs	255	1,344
Hull.		
Ag.imp., pkgs	27	206
Hdw., case	1	50
Mf. iron, pkgs	17	50
Hong Kong.		
Clocks, pkgs.	25	315
Havre.		
Hdw., cs	8	1,444
Copper, pigs.	604	30,100
Sad irons, cs.	52	727
Mach'y, pkge.	1	23
Copper casks.	181	40,703
Pumps, pkgs.	3	140
Ag. imp.,pkgs	36	2,410
Hanover.		
Sleigh bells, case	1	90
Tacks, cs	3	29
Hamburg.		
Sew. ma., cs	2870	46,444
Ag.imp., pkgs	62	708
Tin cans, cs	5	20
Mach'y, pkgs.	17	720
Hdw., pkgs.	181	3,943
Clocks, pkgs.	169	2,031
Arms, cs	12	1,133
Cartridges, cs.	32	630
Mf. iron, pkgs	8	165
Wringers, cs.	10	130
Hayti.		
Nails, kegs	29	71
Mf. iron, pkge	1	4
Cutlery, cs	3	136
Hdw., pkgs	38	443
Tinware, cse.	1	5
Sew. ma., cs.	3	70
Japan.		
Hdw., cs	15	135
Liverpool.		
Hdw., pkgs.	5	383
Clocks, cse	1	175
Rifles, case	1	150
Copper matte, bags	13,945	86,825
Mf. iron, pkgs	3	90
Sew ma., cse.	1	18
Copper bars.	547	23,296
Old met., pgs.	80	1,510
Copper, pigs.	633	33,400
Cartridges cs.	4	101
Gun sights, case	1	29
Mach'y, pkgs	45	1,596
Copper, casks.	695	143,651
Brass goods, cases	2	450
London.		
Clocks, cs	202	2,725
Tin cans, cs	4	60
Iron drums	5	56
Pumps, pkge	1	30
Primed shells, cs	51	1,928
Cartridges, cs.	10	296
Ox. zinc, bbls	100	880
Machy, pkgs.	90	7,705
Firearms, cs.	9	2,050
Hdw., pkgs	30	2,116
Copper, bbls.	20	4,100
Ag.imp., pkgs	287	9,440
Mf. Iron, pkgs	10	162
Sew. ma., cs.	2	299
Corset wire, bbls	5	533
Sew. ma., cs.	5	175
Malaga.		
Clocks, cs	5	120
Chains, cse	1	108
Market Harborough		
Hdw., cs	6	500
Messina.		
Sew. ma., cse.	1	25
Moscow.		
Steam pump.	1	300
Hdw., cs	2	265
Mexico.		
Hdw., pkgs	47	1,147
Granite ware, case	1	17
Clocks, cs	2	20
Nails, cs	4	18
Cutlery, cs	41	731
Brass gds., cs.	2	33
Firearms, cs.	2	737
Sew. ma., cs.	86	1,488
Nails, kegs	4	31
Mf.iron, pkgs.	191	2,461
Tacks, cs	2	34
Mach'y, pkgs.	54	3,412
Cartridges, cs	32	369
Ag.imp., pkgs	16	144
Pumps, pkgs	5	1,363
Spikes, kegs.	100	600
Wheels and axles	6	175
New Brunswick.		
Iron bed plate	1	850
New Zealand.		
Hdw., cse	1	10
Newcastle.		
Mchy, pkge	1	130
Odessa.		
Ag.imp., pkgs	48	3,434
Peru.		
Hdw., cs	2	35
Sew. ma., cs.	15	245
Mf. iron, pkgs	1	37
Clocks, case	1	10
Rotterdam.		
Ag.imp., pkgs	3	134
Copper, bbl.	40	8,200
Hdw., cs	27	337
Mach'y, pkge.	1	130
Arms, cs	3	278
Port St. Mary's.		
Mf. iron, pkgs	1	34
Porto Rico.		
Clocks, cs	3	66
Mach'y, pkgs.	6	1,546
Tacks, case	1	15
Sheet copper, case	1	72
Haw. pkgs	22	360
Spikes, kegs.	16	100
Ag. imp. pkgs.	12	150
Pumps, pkgs.	2	88
Iron, bars	3	32
Mf. iron, pkgs	103	500
Nails, kegs	3	13
Cutlery, cs.	15	177
Machy, pkgs.	2	60
St. Petersburg.		
Hdw., cs	2	200
Santo Domingo.		
Mf. iron, pkgs	20	419
Fire engine	1	100
Hdw., case	1	33
Trieste.		
Mach'y, pkge.	1	76
Venezuela.		
Mf. iron, pkgs.	1,027	5,428
Cutlery, cs	3	90
Pump	1	400
Steel wire rope, pkgs.	2	1,230
Mach'y, pkgs.	4	362
Brass goods, cse	1	18
Nails, kegs	10	32
Hdw. pkgs	69	806
Nails, cs	19	198
Sew. ma., cs.	27	492
Ag.imp., pkgs	7	80
Clocks, cs	11	221
Plumb'rs matl cs	2	90
United States of Colombia.		
Cutlery, cs	77	941
Mf. copper, cs	2	52
Nails, cs	2	43
Water wheel	1	300
Pumps, pkgs.	5	106
Tinware, cs.	36	1,387
Iron, pkgs	31	198
Steel, pcs	5	31
Hdw., pkgs	61	876
Sew. ma., cs.	41	907
Mach'y, pkgs	40	2,020
Mf. iron, pkgs	256	1,847
Ag. imp. pkgs	23	203
Cartridges, cs	2	50
Brass goods, cs	2	50
Air brakes, cse	1	161
Spikes, kegs.	300	1,440
Prtg. presses.	5	585
Iron windlass	1	150
Nails, kegs	94	259
Vienna.		
Sew. ma., cs.	95	2,348

Exports of Metals.

	Jan. 21 to Jan. 28. Pounds.	Jan. 1 to Jan. 28. Pounds.
Copper: F. A. Lomal	796,250	1,296,250
American Metal Co	356,128	896,988
Phelps, Dodge & Co	230,664	230,664
Muller, Schall & Co	225,000	225,000
Copper Queen Con. M. Co	224,034	224,034
J. Kennedy, Tod & Co	112,026	112,026
S. Mendel	112,000	224,000
H. Becker & Co	1,250	1,250
Copper Matte: Williams & Terhune	1,314,898	6,993,874
American Metal Co	90,110	90,110
Old Brass: Burgass & Co	10,318	45,464

Old Metals, Rags, &c.

The purchasing prices offered by dealers are as follows:

Heavy Copper	₩ lb	$0.10 @	$0.12
Light Copper	₩ lb,	@	.09
Copper Bottoms	₩ lb,	@	.09
Brass, Heavy	₩ lb,	@	.08½
Brass, Light	₩ lb,	@	.06½
Composition	₩ lb,	.0,12 @	.12
Lead, Heavy	₩ lb,	.03¾ @	.04½
Tea Lead	₩ lb,	@	.04
Zinc	₩ lb,	.03 @	.03¼
Wrought Iron	₩ ton,	18.00 @	
Light Iron	₩ ton	10.00 @	
Stove Plate Iron	₩ ton,	10.00 @	
Machinery Iron	₩ ton,	13.00 @	13.50
Grate Bars	₩ ton	@	7.00
Old Rubber	₩ lb.	.04 @	.04¼
White No. 1	₩ lb,	.03⅝ @	.03¾
White No. 2	₩ lb,	.01⅝ @	.01¾
Canvas, Linen, No. 1	₩ lb,	.04 @	.04½
Canvas, Cotton, No. 1	₩ lb,	.04⅜ @	.04½
Canvas, No. 2	₩ lb,	.02⅝ @	.02⅞
Seconds	₩ lb,	.01 @	.01⅛
Soft Woolens	₩ lb,	.06½ @	.07
Mixed Rags	₩ lb,	.01 @	.01¼
Tunny Bagging, No. 1	₩ lb,	.02⅛ @	.02¼
Jute Butts	₩ lb,	.02¼ @	.02⅜
Book Stock	₩ lb,	.00⅞ @	.01⅛
Newspapers	₩ lb,	.00¾ @	.01
Waste Paper	₩ lb,	.00¼ @	.00½
Hemp Twine	₩ lb,	.02½ @	.03
Sisil Baling Rope	₩ lb,	@	.03

Metal Market.

Copper.—During the week under review Chili Bars opened on Thursday last at £73. 7/6 in the London market, with sales of 1225 tons, while our own market lacked animation, being at the same time irregular, closing at 16.65¢ for April, and 16.30¢ for February. On Friday London opened at £73. 10/, with sales of 1175 tons, while our own market remained uninfluenced by the slight improvement, remaining dull and easy at 16.65¢ @ 16.75¢ for April, at which 100,000 lb were taken. On Monday London cabled a further advance to £75. 5/, sales amounting to 1275 tons, our own market fully and actively responding, sales reaching 1,375,000 lb at 16.45¢ for spot, 16.50¢ for March, 16.75¢ @ 16.90¢ for April, 16.90¢ for May, 16.65¢ @ 16.75¢ for June and 16.75¢ for July. Yesterday London at first came £3 higher, but subsequently again receded £2, the quotation being £76. 10/, and the sales amounting to 850 tons. Here, in spite of the good export demand, there was a decline and easier market, sales summing up 575,000 lb at 16½¢ @ 17¢, spot; March, 16.50¢ @ 17.05¢; April, 17.15¢ @ 17.05¢, and May, 17¢. To-day the market at the Exchange was quiet, sales on the first call being only 50,000 lb of April at 16.85¢, and 25,000 lb of June at 16.70¢. During the week the representative of the syndicate took one block of 500,000 lb of February Copper at 16.50¢, the seller being identified, according to report, with the smaller Boston companies. Yesterday a leading firm of dealers bought 200,000 lb spot at 16.50¢. As yet manufacturers in the Naugatuck Valley have bought very sparingly, some of them reporting that they are supplied for some time to come. The Calumet and Hecla Company are selling to consumers only their current make, which is close to 2,500,000 lb a month, at going prices, and are to that extent helping manufacturers to keep out of the market. It has been decided to flood the mine thoroughly with carbonic acid, and preparations are now going forward on a larger scale. After the last cave on Sunday the temperature fell about 60°, but the managers appear to recognize that the fire is still smoldering, and more energetic measures are to be resorted to. The talk that the syndicate may control the product of this mine is dismissed as absurd, since the management is openly opposed now, and always has been, to speculative operations. Reports of buying of the controlling interest in the Tharsis Company, of Spain, by the syndicate are not confirmed thus far. One point must be emphasized in connection with the control of leading mines here, in Spain and in Chili, is that it practically commits the syndicate to holding at prices which are profitable to small mines for a period of years. This will dispel a good many doubts in the minds of those interested in mining property now idle as to the expediency of beginning work, since it holds out the prospect that good prices will not be merely temporary. Brass founders are using a large proportion of Scrap Copper and Brass. A good deal of interest attaches in this market to later options on Lake Copper, in connection with the opening of navigation. All rail rates are higher than lake transportation by about ½¢ ₩ lb. From official sources we have the following dates of the arrival of "new" Copper in New York after the opening of navigation: 1868, May 25; 1869, May 24; 1870, May 12; 1871, May 16; 1872, May 30; 1873 and 1874, May 29; 1875, June 7; 1876, May 26; 1877, May 24; 1879, May 16; 1880, May 18; 1881, May 28; 1882, May 16, and 1883, May 28. It will be noted, therefore, that "new" Copper may be expected by the end of May, so

that naturally June options should be ¼¢ lower than May. Exports to January 28, inclusive, foot up 5,959,397 lb Ingot, and 7,083,984 lb Matte, equal to 4,250,000 lb Fine Copper. Closing quotations for Lake Ore: Spot, 16.55¢ bid and 16.65¢ asked; February, 16.60¢ and 16.65¢; March, 16.70¢ and 16.80¢c; April, 16.85¢ and 16.90¢: May, 16.80¢ and 16.95¢, and June, 16.65¢ and 16.80¢ respectively bid and asked. Casting brands, in which little business is being done, are quoted nominally 15.50¢. This morning's cable for Chili Bars was £77, and later £76. 12/6. We print under Foreign Markets a full extract from the valuable annual report of Messrs. James Lewis & Son, of Liverpool.

Tin.—The market in London has at last undergone a change in the direction of higher prices for spot and futures, advancing on Friday to £167. 10/ for spot and £145 for futures, rising on Monday to £170 and £146 respectively, remaining unchanged on Tuesday and opening the same to-day. It closed lower, for spot £169 and futures, £146. Here little has been done, April Tin advancing from 33.10¢ on last Thursday to 33.80¢ on Monday and Tuesday. The market closes with 37¢ @ 37.10¢ asked for spot, and 37.25¢ asked for shipment; February, 36.60¢ bid and 36.75¢ asked; March, 34.90¢ bid and 35.30¢ asked and 33.80¢ bid for April. *Tin Plates.*—During the week the oil men have been buying a few spot lots on account of non-arrivals, while canners have been in the market sparingly and little has been done by roofers. Consumers generally appear to anticipate lower prices, and are holding off. For forward delivery prices are easier. The New York market rules at about the following quotations for large lots: Siemens-Martin Steel, Charcoal finish, $5.25 @ $5.37½; ditto Coke finish, $5; Ternes, $4.35 @ $4.50; Bessemer Coke, $4.80 @ $4.85, and Wasters, $4.65.

Lead.—The market has been quiet and is easier, with little business reported during the week. By good authority the future is not regarded as promising to speculation for a rise. Production is abundant, and so far as the formation of a syndicate is concerned one of the leading German producers is credited with the statement that it is out of the question. The tariff agitation, too, is unsettling the trade. Foreign Lead can never be laid down here at 5.07½¢. We quote at the close 4.90¢ @ 4.95¢.

Spelter.—Reports from the West allude strongly to the rising Ore market, due to scarcity caused by the effect of the inclement weather on mining operations. As much as $30 has been paid for Ore, and it is reported that five smelters in the West are now practically bare of raw material. On the other hand, the restriction in the buying of Copper by Brass manufacturers is having its effect on the volume of business in Zinc, and besides there is a block of over 1000 tons in the hands of outside parties here, which comes out at anything above 5.30¢, which we quote for Common Domestic. *Sheet Zinc* is 5¾¢ @ 5¾¢, in round lots.

Messrs. F. W. Heyne & Brother, brokers, of New York, have again issued their annual chart, showing the fluctuations in the price of Ingot Copper from 1878 to 1887, both inclusive.

New York Metal Exchange.

The following sales are reported:

THURSDAY, January 26.

10 tons Tin, February	35.90¢
75,000 lb Copper, January	16.25¢
25,000 lb Copper, February	16.30¢
25,000 lb Copper, March	16.55¢
25,000 lb Copper, March	16.60¢
50,000 lb Copper, March	16.6 ¢
25,000 lb Copper, March	16.70¢
75,000 lb Copper, April	16.80¢
25,000 lb Copper, May	16.65¢
25,000 lb Copper, spot	16.65¢
16 tons Lead, March	4.97½¢
16 tons Lead, April	4.97½¢
16 tons Lead, May	4.92½¢
20 tons Tin, April	33.10¢
50,000 lb Copper, April	16.65¢
32 tons Lead, April	4.97½¢
32 tons Lead, May	4.92½¢
100,000 lb Copper, February	16.30¢
250,000 lb Copper, April	16.65¢
50,0 0 lb Copper, March	16.52½¢
100,000 lb Copper, April	16.65¢

FRIDAY, January 27.

25,000 lb Copper, April	16.75¢
25,000 lb Copper, April	16.70¢
10 tons Tin, March	34.30¢
50,000 lb Copper, April	16.65¢
10 tons Tin, March	34.50¢
10 tons Tin, April	33.25¢

SATURDAY, January 28.

125,000 lb Copper, May	16.60¢
10 tons Tin, March	34.35¢

MONDAY, January 30.

25,000 lb Copper, May	16.70¢
175,000 lb Copper, June	16.65¢
10 tons Tin, April	33.75¢
50,000 lb Copper, February	16.40¢
25,000 lb Copper, April	16.75¢
25,000 lb Copper, May	16,75¢
50,000 lb Copper, spot	16.45¢
500,000 lb Copper, February	16.50¢
25,000 lb Copper, May	16.80¢
50,000 lb Copper, June	16.65¢
50,000 lb Copper, July	16.65¢
50,000 lb Copper, March	16.75¢
100,000 lb Copper, March	16.85¢
50,000 lb Copper, April	16.90¢
50,000 lb Copper, May	16.90¢
75,000 lb Copper, June	16.75¢
20 tons Tin, April	33.80¢
25,000 lb Copper, March	16.85¢
50,000 lb Copper, May	16.85¢

TUESDAY, January 31.

25,000 lb Copper, spot	17.00¢
25,000 lb Copper, spot	16 95¢
25,000 lb Copper, March	17.05¢
50,000 lb Copper, April	17.15¢
25,000 lb Copper, April	17.05¢
25,000 lb Copper, May	17. 0¢
48 tons Lead, April	4.90¢
10 tons Tin, April	33.80¢
25,000 lb Copper, May	17.00¢
50,000 lb Copper, April	17.05¢
100,000 lb Copper, March	16.90¢
25,000 lb Copper, March	16.65¢
75,000 lb Copper, March	16.50¢
200,000 lb Copper, spot	16.50¢

WEDNESDAY, February 1.

50,0.0 lb Copper, April	16.85¢
25.000 lb Copper, June	16.70¢
75,000 lb Lake Copper, spot	16.60¢

Paints.

Black, Lamp—Coach Painters'	₩ lb 22 @ 24¢
" Ordinary	6¢
Black, Ivory Drop, fair	12 @ 18¢
" best	23¢
Black Paint, in oil	kegs, 8¢; assorted cans, 11¢
Blue, Prussian, fair to best	40 @ 55¢
" " " in oil	45 @ 55¢
" Chinese dry	7¢
" Ultramarine	18 @ 30¢
Brown, Spanish	1¼¢
" Van Dyke	10 @ 12¢
Dryers, Patent American	ass'd cans, 9¢; kegs, 7¢
Green, Chrome	15 @ 23¢
Green, Chrome in oil	14 @ 18 @ 25¢
Green, Paris	good, 30¢; best, 25¢
Green, Paris in oil	good, 30¢; best, 35¢
Iron Paint, Bright Red	₩ lb 3½¢
Iron Paint, Brown	₩ lb 1½¢
Iron Paint, Purple	₩ lb 3¢
Iron Paint, Ground in oil, Bright Red	₩ lb 6½¢
Iron Paint, Ground in oil, Red	₩ lb 5½¢
Iron Paint, Ground in oil, Brown	₩ lb 5½¢
Iron Paint, Ground, Purple	₩ lb 6¢
Litharge	6½¢
Mineral Paints	2 @ 4¢
Orange Mineral	10¢
Red Lead, American	6½¢
Red Venetian (Eng.) dry	$1.65 @ $1.70
Red Venetian in oil	asst'd cans, 11¢; kegs, 8¢
Red Indian Dry	9 @ 12¢
Rose Pink	10 @ 13¢
Sienna, American Raw, powdered	4¢
Sienna, Burnt, powdered	4½¢
Sienna, Burnt, in oil	10 @ 16 @ 20¢
Sienna, Raw	11 @ 15 @ 25¢
Umber, Burnt, powdered	4 @ 8¢
Umber, Burnt, in oil	9 @ 12 @ 15¢
Umber, Raw, powdered	4 @ 7½¢
Umber, Raw, in oil	9 @ 12 @ 15¢
Vermillion, Chinese	90¢
Vermillion, English	70 @ 71¢
Vermillion, American Common	15¢
White Lead, American pure dry	6¢
White Lead, American pure dry, in oil	7 @ 7½¢
White Paris, English Prime	2 @ 2½¢
Yellow Ocher, French	$1.75
Yellow Ocher, French, in oil	asst'd cans, 11¢; kegs, 8¢
Yellow Ocher, Vermont	in casks, 1½¢
Yellow Chrome	17 @ 27¢
Yellow Chrome, in oil	14 @ 18 @ 25¢
Zinc White, American No. 1, dry	5 @ 6¢
Zinc White, American No. 1, in oil	9¢
Zinc White, French (Paris Dry)	6¾ @ 7¾¢
Zinc White, French, in oil	10 @ 11¢

The revival of trade in England is again the subject of remark by the London *Times*, which says: "The Board of Trade returns for December are of a highly satisfactory character, and, following on the very good returns for November, they demonstrate fully the reality of the revival in trade, which we have frequently given reasons for thinking was taking place. It is a long time since there was so large an expansion in the total volume of foreign trade as is shown in the present returns. The imports amount to £34,174,000, an increase of £3,163,000, or about 10¼ per cent.; and the exports to £20,385,000, an increase of £3,232,000, or about 19 per cent. There are hardly any exceptions to the increase in the imports, but these exceptions include cotton, wool, leather and tea, which are important articles. The exports show a general increase, but especially in iron and steel, machinery and millwork, hardware and cutlery, and cotton piece goods. The latter were taken in increased quantities not only by India, but by China."

A Pekin correspondent of the London *Times* gives an interesting account of the great inundation last October, by which over 1,000,000 persons lost their lives. The banks of the Yellow River yielded to the pressure of accumulated waters and 150 villages were soon submerged in the valleys below. The Government has given orders to close the breach and confine the water in its old channel with all possible speed. With this object the Imperial Treasury has been directed to forward $2,500,000 at once to the local authorities. Should the attempts fail, the inhabitants of a densely-populated tract of country nearly 400 miles in length will be condemned to years of hopeless misery, and the task must be begun of embanking the river on both sides for all this distance.

The New York salt wells, at Syracuse, last year yielded nearly 5,700,000 bushels, of which about one-half was fine salt, but for the last two years the State has derived therefrom no income, and fears are expressed that this failure will be permanent on account of the decreasing strength of the brine and the successful rivalry of Michigan, where fuel for evaporation is cheaper. The New York manufacturers are endeavoring by improved methods to overcome the apparent advantages of other localities, and believe that with their experience and facilities for shipment they will be able to restore their lost prestige in the fine salt trade. It is stated that the salt beds of Western New York extend about 120 miles from east to west, and about 40 to 50 miles from north to south. The area of the salt bed territory is therefore nearly 5000 square miles, and the average thickness is 40 feet. This means that the supply is practically inexhaustible.

The prosperity of California continues unchecked. Property in the State last year increased $132,000,000 in assessed value. The product of wine for the year was 17,000,000 gallons; of grape brandy, 800,000 gallons; raisins, 1,000,000 boxes. Among the shipments for the year were: Vegetables, 40,000,000 pounds; canned goods, 50,000,000 pounds; dried fruit, 16,000,000 pounds; green deciduous fruits, 35,000,000 pounds, and oranges 1,000,000 boxes. In wool, wheat, barley, flour and hops it was an average year.

Important coal discoveries have been made recently near Ironton, Ohio. About 22 miles distant on the Dayton and Ironton Railroad there is a vein known to be at least 4 feet thick. The Olive Furnace property embraces a large area of the seam, and a belief is expressed that the coal resources of this region are more extensive than those of the Hocking Valley. In Gallia County there are from 36 to 40 inch seams which also promise well, giving iron manufacture a new impulse.

General Hardware.

The severe weather which has prevailed in many parts of the country has necessarily had a depressing effect upon trade, and the market, as a consequence, is quiet. There are also few changes in price, and the general situation remains unchanged.

NAILS.

The New York market is quiet and firmer, with more inquiry and less disposition to make concessions. Some buyers show a desire to anticipate future requirements, but thus far the heavier buying reported from the West has not crossed the Allegheny Mountains. The labor troubles in the East have thus far had only a local effect, and are without special significance so far as the Nail trade is concerned. We quote for small lots from store for Iron Nails, $2.

BARB WIRE.

The New York market is dull, with prices nominally 4 cents for carload lots of galvanized Barb Wire. From the West continue to come reports of low prices in spite of the resolutions recently passed at the Chicago meeting.

WIRE NAILS.

The market continues without change, there having been no further shrinkage in price. The demand is fair and the mills are well supplied with orders.

MISCELLANEOUS PRICES.

The trade will observe that we have in our quotation columns substituted as the basis of our quotation on Tacks the list January 2, 1888, for the one which has heretofore been referred to. This change is made in view of the fact that most of the manufacturers have adopted the new list, so that it will probably be hereafter generally used. Some of the merchants are still adhering to the old list and discounts, but the indications are that the new prices will soon be adopted. It is not necessary to remind the trade of the desirability of having uniformity of lists, and the list January 2 would seem to be the one which, until further action is taken, will be the standard. It will, therefore, be well to have it in force as soon and as generally as possible.

Malin & Co., Cleveland, Ohio, on account of the advance in Brass and Copper Wire announce the following revised discounts on Spooled Wire:

	Dis. per cent.
Annealed Steel and Tinned Wire	50
Brass and Copper Wire	40

The prices of Axles have gradually been stiffening and advanced quotations are now announced.

The organization of the manufacturers of Brass, Steam and Water Goods is reported to be working very satisfactorily. By a resolution adopted at their late meeting all plumbers, steam or gas-fitters, as well as merchants, were admitted to the benefit of dealers' discounts, providing that their purchases annually from members of the association be not less than $5000, any purchases in excess of that sum to have a proportionately increased discount. The effect of this action is practically to put on the preferred list, which has heretofore been limited to large dealers, any persons who purchase the requisite quantity of goods. It is thought that its effect will be to induce some small manufacturers to purchase their goods from the association instead of making them.

The Standard Company, Boston, Mass., announce the following revised prices for Egg-beaters:

Acme, per gross	$ 6.00
Kingston, per gross	6.50
Standard, per gross	9.00
Duplex, per gross	18.00
Rival, per gross	12.00

The following are the discounts of the

IRELAND MFG. COMPANY.

Cincinnati, Ohio, for whom Wm. H. Jacobus, 90 Chambers street, New York, is agent, applying to their 1888 catalogue, referred to in a recent issue. Ternes, 60 days, net, with a discount of 2 per cent. for cash in 10 days:

Page in 1888 catalogue.	Dis. per cent.
3, Morris Sash Locks	60
4, Triumph Sash Locks	60
4½ Victor Sash Locks	60&10
4¾, Mortise Knob Latches	60
5–21, Mortise Knob Locks	60
22–35, Front Door Mortise Locks	60
36–55, Front Door Mortise Locks in Sets, with Knob and Rose and Escutcheon, complete	60
56–59, Mortise Knob Locks in Sets, with Knob and Rose and Escutcheon, complete	60
60, Store Door Dead Locks	60
61, Mortise Night Latch	60
62–65, Rim Night Latches	60
66–69, Store Door Handles, in Sets	60
70–73, Sliding Door Locks	60
74–76, Sliding Door Latches	60
77, Sliding Door Pulls	60
78, 79, French Window Locks and Trimmings	60
80, 81, Mortise Door Bolts with Thumb Knob	60
82, 83, Flush and Extension Bolts, Nos 3390 to 03398	60
83, Flush Bolts, No. 4393	60
84–86, Gong and Lever Bell Pulls	60
87, Electric Push Button	60
88, 89, Sliding Door Flush Cup Escutcheons	60
90–99 Rose and Escutcheons combined	60
100–102, Plate and Drop Escutcheons	60
103, Push Plates	60
104, 105, Patent Sash Lift and Lock	60
106, 107, Flush Sash Lifts	60
108, 109, Hooked Sash Lifts	60
110–112, Shutter Bars	60
113, Shutter Knobs	60
116, Screen Door Catches	50
116, Screen Door Pulls	60
117, Cupboard Catches	60
118, Cupboard and French Window Catches	50
119, Cupboard Turns	60
120, Cupboard Bolts	70
121, Chain and Bottom Bolts	50
22, Square Foot Bolts	50
123 Barrel Bolts	50
124–127, Bronze Metal Door Knobs	60
128, Wood Door Knobs	50
129, Sash Pulls, Plates and Sockets	70
130, Door Pull Handles	60
131, Line Cleat	50
131, 132, Store Door Handles, Ornamental	50
133, Store Door Handles, Japanned	50
134, Cottage Door Handles	50
135, Roggins Latches	60
135, Brass Shutter Sheaves	60
136, Self-Closing Gate Hinges	50
136, Surface Gate Hinges	50
137, Gate Latches	25
137, Transom Pivots, Brass	60
137, Transom Pivots, Iron	40
138, Boileau's Shutter Hinges	70
139, Lull & Porter's Shutter Hinges	70
140, Shutter Fasteners, Mackrell's Japanned	50
140, Shutter Fasteners, Stetson's Japanned	60
140, Shutter Fasteners, Drop Turnbuckle	60
141–145 Drawer Pulls, Bronze Metal	60
142–145, Drawer Pulls, Tucker Bronzed	60
146–154, Coat and Hat Hooks	50
155, Chandelier Hooks	50
156, 157, Keys and Key Blanks	60
158, Window Springs	50
158, Sash Cord Irons	40
158, Door Buttons	40
159, Shutter Flaps, Nos. 30 to 33	60
159, Shutter Flaps, No. 34	60
159, Shutter Butts, Nos. 40 to 43	60
159, Shutter Butts, No. 44	60
161–169, Ornamental Bronze Metal Loose Pin Butts	60
171, Polished Bronze Metal Loose Pin Butts	60
173, Loose Joint Butts, Bronze Metal	60
175, Loose Pin Butts, Tucker Bronzed	60
177, Loose Pin Butts, Boston Finish	60
177, Loose Pin Butts, Tucker Bronzed	60
184–185, Letter Box Plates	60
185, Hooked Sash Lift	60
186, Brown's Perfect Shutter Worker	60

TRADE TOPICS.

A correspondent calls attention to the fact that it is desirable that manufacturers of Carriage Bolts should turn the Nut further on the Bolt than is usually done, with a view to prevent the falling off of the Nuts. This is referred to emphatically as a "terrible nuisance."

We are in receipt from correspondents, extracts from whose letters are given below, of the following advices in regard to the condition of trade and the outlook for business in the localities to which they relate:

Macon, Ga.—The close of the year 1887 found many of our planters unable to meet their creditors with the money to pay their debts. This was due to a short crop and low prices for cotton. However, provisions of all kinds are more plentiful in the country than for years, and the planters will require less advances from their factors to make the next crop. All have gone to work with the determination to make a crop this year on as small an expense as possible. This will probably decrease the volume of trade for the spring, but will place business on a much firmer footing for the fall trade.

Owensboro, Ky., January 16, 1888.—Trade is starting off very satisfactorily with us, collections are improving, and as values in most goods are improving we expect a prosperous year. Our section, as you no doubt know, is a great tobacco producing country, and prices are very high for the weed. Crops were not more than half in tobacco, corn, potatoes, &c., but as prices are so much better, the amount of money in the pockets of the farmer is fully equal to 1886, when crops were really good here.

EXPORT TRADE.

The exports of Agricultural Implements are on a larger scale from week to week, with the approach of the spring season, but have continued without cessation thus far through the winter months, thus demonstrating the steadiness of the foreign demand. For the current week the exports of Implements adapted to agriculture are in good round volume, comprising upward of 1300 packages and indicating a valuation of about $80,000. It is significant that the larger demand is from London, showing not only that the American implement is in favor despite European competition in attempted imitations, but that London is an important point of distribution. The exports to that city for the single week include 287 packages, valued at $9440. Odessa, the leading grain port in Russia, takes Implements to the value of $3434 and the Argentine Republic 823 packages, valued at $23,000. Havre takes implements to the value of $2400 and Hamburg 708. Smaller lots are distributed at various ports in Central and South America and the West Indies. American manufactures in this line are noted for their strength and lightness, as well as their admirable adaptation to the wants of the cultivator of the soil. Moreover, as the several parts are interchangeable, repairs are made with facility.

ITEMS.

The Hall & Willis Hardware Company, Kansas City, Mo., have issued an exceptionally complete and satisfactory catalogue representing the varied lines of goods handled by them. It is a volume of more than 1000 pages, fully illustrated, and showing careful and intelligent preparation. It opens with a department devoted to Mechanics' Tools and Farming Implements, which occupy more than 200 pages, commencing with Axes and closing with Wheelbarrows. Builders' Hardware is next represented, and occupies nearly 300 pages. The third department includes an assortment of General Hardware, in which are to be noted Blocks, Chains, Horse Shoes, Snaps, Sleigh Bells, Curry Combs, Coffee Mills and a very large variety of other goods. The fourth department relates to Sporting Goods, and is followed by an exhibit of Table and Pocket Cutlery, Razors, Shears, &c. After this Spoons and Silver-Plated Ware are represented, followed by Department 7 devoted to Granite Iron Ware and Tinned and Japanned Ware, Tinners' Trimmings, &c., the volume ending with Department No. 8, embracing Tinners' Tools and Machines. The trade will appreciate the convenience that results from this classification. The care that has been taken in compiling the volume is evidenced in the fact that in all cases, we believe, goods of the same kind occupying two pages are so arranged as to occupy opposite pages, so that the whole assortment is seen at a glance, the same principle being followed in cases where the goods occupy any even number of

pages. In the preface it is stated that the aim of the company in preparing the catalogue has been to produce a plainly printed, fully descriptive and strongly bound book, which while accurately representing their stock will be of a size convenient to handle and especially useful for reference. It is to be noticed that they have in nearly all cases given the manufacturers' names, numbers and lists, a feature which will be appreciated by the trade. The book has evidently been bound with especial care, and has the appearance of a volume that will for a long time serve those who receive it. Another point worthy of notice is the fact that while the whole book is printed on excellent paper, the index, which is very full and complete, is printed on a particularly strong and tough paper, which will save it from suffering as do so many catalogues which are much used in the giving way of the edges of the index pages. This is, we believe, the first large catalogue which has been issued west of St. Louis, and is exceedingly creditable to the company that send it out, and indicates the growing importance of Kansas City as a Hardware center.

Having severed his connection with the firm of Richards & Co., Boston, Mass., William Q. Wales announces that he will continue the business of importing and dealing in Metals at No. 26 Oliver street, Boston, a few doors from Milk street.

The Gilbert & Bennett Mfg. Company, of New York, Chicago and Georgetown, Conn., are putting on the market a new kind of Wire Cloth, which they have named Pearl. It is coated with a metallic preparation of their own invention, which is for the purpose of preventing rust, exhaustive tests of its efficiency having been made. The Wire Cloth coated in this way is as lustrous as steel, while the corners of the meshes are not clogged up, as in the case of galvanized or painted cloth, but the free circulation of air is secured. It is made in two styles, heavy for doors and light for windows. The company have recently bought out the Northwestern Steel Wire Broom and Brush Manufactory of A. Graff, the oldest manufacturer of such articles in Chicago, and will hereafter make that line of goods at their Chicago factory, Nos. 14 to 18 South Canal street. An improvement in the goods which they are bringing out this season is the use of three wires instead of two in the selvedge of their 2-inch Cottage, Lawn and Garden Fencing and 2-inch Poultry Netting, making these goods much stronger and stiffer. A new factory building has recently been completed at Georgetown, Conn., 200 feet long by 50 feet wide, of two stories, the walls of which are constructed of Wire Cloth. The outside wall is composed of Wire Cloth and cement, and an inner wall is composed of Wire Cloth and plaster. The method of construction has been patented. An office and boiler-house had previously been built in the same way, but upon a much smaller scale. The new building is being filled with looms for weaving Wire Cloth.

Donald McKay, Jr., is now acting as traveling salesman with the American Bit Brace Company, Buffalo, N. Y., and intends to travel through the East and West and Canada, and will be gratified if his customers will hold their orders until seeing him. The company are actively engaged in preparing what they refer to as an exceptionally fine line of Braces, and hope to be in a position to fill orders by March 1.

W. P. Townsend & Co., New Brighton, Pa., issue, in neat and unique form, their price list of Steel Wire Nails, and also the revised tariff on Norway Iron Rivets. In regard to both of these lines illustrations are given, and tables in regard to the number in a pound, &c.

The Gender & Haeschke Mfg. Company have been incorporated at Milwaukee, Wis., to deal in Hardware, with a capital of $100,000. The incorporators are William Gender, C. A. Haeschke, and F. J. Frey.

C. C. Loring, formerly connected with Tyler Bros. Tube Works, Boston, has engaged in the general commission business in Iron and Steel, at 52 Kilby street, Boston.

The trade will observe that page 77 is occupied by the Shepard Hardware Co., Buffalo, N. Y., in a presentation of their manufactures, the Lightning Freezer and Queen City Press being prominently illustrated.

Announcement is made, Antigo, Wis., January 25, that a company has been organized for carrying on a general Hardware business under the corporate name of the Lewis Hardware Company, to do business at the village of Rhinelander, Oneida County, Wis., the capital stock being $5000. Stockholders are announced as J. C. Lewis, B. R. Lewis, F. A. Forbes, Edward Cleary and S. D. Nelson. The business of the company will be under the management of B. R. Lewis, now a member of the firm of J. C. Lewis & Co., Antigo, Wis., the members of which are all interested as stockholders in the new company.

Puster Bros, 44 South Canal street, Chicago, have made arrangements to handle the Adjustable Drop and Post Hangers with babbitted bearings, manufactured by Sheriff & Ashworth, of Pittsburgh, for which they are ready to fill orders promptly. They also offer their own Wood-Rim All-Split Pulleys, from 9 to 72 inches, always in stock, and a large assortment of Shafting, Couplings, &c.

Announcement is made, Lamar, Clinton County, Pa., January 9, that the copartnership heretofore existing between H. D. Loveland and E. E. Hyatt, doing business as the Loveland Axe Company, has been dissolved, and that the business of the firm will be settled by Mr. Hyatt. Announcement is also made, January 16, that H. D. Loveland and C. W. Loveland have formed a copartnership to be styled the R. Loveland Axe Company, and will continue the manufacture and sale of the Loveland Axes. It is stated that they are both practical Axe men, and will spare no pains to furnish good Axes.

A catalogue illustrating Heinz & Munschauer's line of Refrigerators, with illustrations of the different styles and explanation of their special features, is issued by E. H. Huenefeld, Cincinnati, Ohio.

Announcement is made by O. W. Bullock, Springfield, Mass., that J. A. Robbins has been associated with him as partner, and that the new firm will do business under the name of O. W. Bullock & Co. Mr. Robbins is referred to as having had several years' experience in the Jewelry trade, and as being a practical watchmaker whose suggestions and oversight in the manufacture of tools will be of special value.

Howard & Morse, 45 Fulton street, New York, have issued their catalogue No. 59, containing 126 pages, fully illustrated, in which are represented the different lines of Wire Goods of which they are manufacturers. It relates to a wide line of Wire supplies, including Wire Cloth, Wirework in general, and Mining, Mill and Foundry Wire and Iron Supplies, Fencing and Railings, Stable Fixtures, Lanterns, &c. Special attention is devoted to Wire Cloth for mining purposes, and care has been taken to illustrate many of the heavy grades, cuts showing the exact size of mesh and gauge of metal being given. Different grades ranging from ½-inch mesh of ⅝-inch rods to No. 100 mesh Wire Cloth are illustrated. Beyond this point, however, it is not feasible to illustrate the extremely fine meshes made. The catalogue represents a variety of articles of interest to the Hardware trade, and there is a satisfactory exhibit of designs in Wire and Brass Office Railings and supplies in Wire Goods for blast furnaces, foundries, machine shops, &c. The catalogue is, in short, an exceedingly comprehensive and interesting one, and will be of service to the trade.

It is interesting to observe the new uses to which Indurated Fibre Ware is being put. In this connection the trade will be interested in the advertisement on page 56, in which Monroe Bros., of Cleveland, Ohio, refer to their use of this material in the manufacture of Refrigerators. It is proposed, as we understand it, to substitute Indurated Fibre for the entire inside lining of the Refrigerator in lieu of Zinc, Stoneware or Wood. The well-known properties of Indurated Fibre, tasteless, odorless, non-absorbtive of either moisture or odor, and cleanliness, together with the fact that it is one of the best non-conductors of heat, are regarded as adapting it to this service, while its use will also reduce the weight of the Refrigerators. It is even expected to utilize this material for the lining of the doors, as the Indurated Fibre will neither shrink nor swell.

We regret to learn that the Hardware establishment of John M. Spann, Malone, N. Y., together with the entire block in which the store was situated, was destroyed by fire on Sunday morning. The aggregate loss is estimated at $150,000. The fire spread so rapidly that very few of the merchants saved goods of any value. Mr. Spann advises us that it is not his intention to resume business at present, and he desires that manufacturers or merchants who have taken orders for future shipment to him cancel the same.

The trade will observe, on page 114, the advertisement of C. F. Guyon & Co., 99 Reade street, New York. It will be of special interest as the announcement of a house recently organized and giving a list of the manufacturers, many of whom will be recognized as occupying a prominent position, for whom they are agents.

The particulars of the auction sale by Haydock & Bissell, February 8, 9 and 10, are given in their announcement on page 52. This is the cutlery sale to which we referred in our last issue. Its importance will be indicated by a perusal of the advertisement.

C. Sidney Shepard & Co., Chicago, Ill., have issued their spring circular of seasonable and other goods. It bears date February 1, and represents a varied assorment of the line to which it relates.

Morley Bros., East Saginaw, Mich., have issued a new edition of their circular relating to the Railroad Step Ladder, with reference also to their Blue Line Lumbering Tools.

We would call the attention of the trade to the copartnership notice on page 53, in which a change in the name of the old and well-known house of W. N. Seymour & Co., of this city, is announced, resulting as a consequence of the death of J. H. White. The new partnership consists of A. B. White, A. B. Haulenbeek and E. C. Van Glahn. The business will hereafter be carried on under the firm name of White, Van Glahn & Co., who will occupy the old stand, 15 and 16 Chatham square.

Under date of February 1 it is announced that Charles X. Cordier has concluded arrangements with the Manhattan Brass Company, First avenue, between Twenty-seventh and Twenty-eighth streets, to act as manager of their sales department. All communications should hereafter be addressed to him there, where he will be happy to meet his old patrons and friends.

The Barton Bell Company, Easthampton, Conn., issue a circular to the wholesale Hardware trade, January 20, in which they allude to the prices of Copper and Tin, the metals which compose Bell Metal, as being so high that it is probable that purchases will be limited to comparatively small lots of Bells, and saying that their agents, John H. Graham & Co., 113 Chambers street, New York, have a complete stock of their Bells, and will be glad to forward small orders with other goods, or to deliver to any other house in the city where purchases are made.

The firm of Knoblauch & Bro., Jersey City, N. J., was dissolved January 31. A new firm, consisting of F. W. Knoblauch and August A. Knoblauch, under the name of Knoblauch & Bro., is announced, who will carry on the business.

Loring & Parks, Plymouth, Mass., for whom John H. Graham & Co., 113 Chambers street, New York, are selling agents, issue a circular with effective illustration of their boxes of Plymouth Rock Steel Carpet Tacks, Uniform Weight, either 2 or 4 ounces in a paper.

The advertisement of the Francis Axe Company, Buffalo, N. Y., occupying page 65, will attract attention. The company advise us that their new circular is in the printer's hands, and will probably be ready for distribution in about a week.

L. C. Wessels & Co. announce that on and after February 1 they will be open for business at their new quarters, 17 North Sixth street, Philadelphia, where they will represent and carry in stock full lines of goods for which they are agents.

THE STANLEY WORKS,

New Britain, Conn., and 79 Chambers street, New York, have issued under date January 24 a discount sheet applying to their catalogue of 1887. They have also issued in sheet form the new Tack list, January 2, 1888, which is very clearly printed, the numbers of the different kinds of Tacks being inserted in connection with the general description of the goods in the list. The discounts on Tacks, Nails, &c., are those which we have already printed. The rest of the sheet, applying to their well-known line of Butts, Hinges, Bolts, &c., is as follows, there being an additional 2 per cent for cash:

	Discount per cent.
Bronzed Capped Butts, Nos. 200, 201, 201¼	202, 50&10
Bronzed Loose Joint Butts, Nos. 206, 207, 207¼	35
Bronzed Loose Joint Butts, Nos. 208, 209, 210, 211,	25&10
Bronzed Loose Joint Butts, Nos. 212, 213, 214, 215,	20&10
Bronzed Loose Joint Butts, Nos. 226, 228, 230	40&10
Bronzed Loose Joint Butts, Nos. 230, 234	30&10
Bronzed Loose Pin Butts, Nos. 236, 237, 237¼	35
Bronzed Loose Pin Butts, Nos. 238, 239	25&10
Bronzed Loose Pin Butts, Nos. 240, 241	20&10
Bronzed Loose Pin Butts, No. 242	40&10
Bronzed Loose Pin Butts, No. 244	30&10
Bronzed Car Butts, Nos. 246, 248	35
Bronzed Car Butts, No. 250	60
Bronzed Parliament Butts, Nos. 252, 253, 253¼, 254, 255, 255¼	40
Bronzed Parliament Butts, Nos. 256, 257	30
Bronzed Parliament Butts, Nos. 258, 260	40
Bronzed Parliament Butts, No. 262	30
Bronzed Parliament Butts, Nos. 264, 266	40
Bronzed Parliament Butts, No. 268	40
Bronzed Light Parliament Butts, Nos. 272, 274	50
Bronzed Light Narrow Butts, Nos. 282, 283, 284,	40&10
Bronzed Light Narrow Loose Pin Butts, No. 286	40&10
Bronzed Light Reversible Butts, No. 288	40&10
Bronzed Extra Light Butts, No. 290	40&10
Bronzed Broad Butts, No. 291	40&10
Bronzed Light Loose Joint Butts, No. 292	40&10
Bronzed Light Inside Blind Butts, Nos. 330, 332, 333, 334, 335, 338	40&10
Bronzed Shutter Butts, No. 344	40&10
Bronzed Wash Tray Hinges, No. 347	30&10
Bronzed Screws (R. & E. list), No. 352	55
Bronzed Mortise Flush Bolts, Nos. 361, 361¼	30&10
Bronzed Flush Bolts, Nos. 362, 364, 366, 368, 370, 372	30&10
Bronzed Flush Bolts, Nos. 374, 376, 378, 380, 382, 384	30&10
Bronzed Flush Bolts, Nos. 386, 388, 390, 392, 393	30&10
Bronzed Sunk Flush Bolts, Nos. 393¾, 393⅛, 394, 396, 398, 400	50&10
Bronzed Barrel Bolts, Nos. 402, 404, 406, 408	40&10
Bronzed Shutter-Bars, No. 450	50
Bronzed Sliding Door Rail Bolts, No. 491	40&10
Nickel-Plated Capped Butts, No. 500	50&10
Nickel-Plated Capped Butts, No. 501¼	50
Nickel-Plated Capped Butts, No. 502	50&10
Nickel-Plated Loose Joint Butts, Nos. 506, 507, 507¼	35
Nickel-Plated Loose Joint Butts, No. 508	40&10
Nickel-Plated Car Butts, No. 510	35
Nickel-Plated Loose Pin Butts, Nos. 512, 513, 513¼	35
Nickel-Plated Parliament Butts, Nos. 514, 515, 515¼, 516	40
Nickel-Plated Light Parliament Butts, Nos. 518, 520	40
Nickel-Plated Light Narrow Butts, Nos 522, 524	40&10
Nickel-Plated Light Reversible Butts, Nos. 526, 528	40&10
Nickel-Plated Loose Pin Light Narrow Butts, Nos. 530, 532	40&10
Nickel-Plated Light Loose Joint Butts, Nos. 534, 536	40&10
Nickel-Plated Back Flaps, Nos. 544, 548	40&10
Nickel-Plated Inside Blind Butts, No. 552	40&10
Nickel-Plated Light Inside Blind Butts, Nos. 554, 556, 557, 560	40&10
Nickel-Plated Shutter Butts, Nos. 564, 568	40&10
Nickel-Plated Light Inside Blind Butts, No. 566,	40&10
Nickel-Plated Brass Barrel Bolts, No. 570	40
Boston Finish Loose Joint Butts, Nos. 600, 601	40
Boston Finish Loose Pin Butts, Nos. 602, 603	40
Boston Ginish Loose Joint Butts, No. 604	40&10
Boston Finish Car Butts, Nos. 606, 607	40
Boston Finish Parliament Butts, Nos. 608, 609, 612	40
Boston Finish Light Narrow Butts, No. 616	40&10
Boston Finish Light Inside Blind Butts, No. 625,	40&10
Olive Bronzed Light Reversible Butts, No. 632,	40&10
Olive Bronzed Light, Narrow Loose Pin Butts, No. 634	40&10
Olive Bronzed Light Narrow Butts, No. 636	40&10
Olive Bronzed Light Inside Blind Butts, No. 638,	40&10
Boston Finish Extra Heavy Flush Bolts Nos. 642, 644, 646, 648	30&10
Boston Finish Extra Heavy Flush Bolts, Nos. 650, 652	30&10
Boston Finish Sunk Flush Bolts, Nos. 654, 656	50&10
Olive Bronzed Barrel Bolts, Nos. 658, 660	40&10
Japanned Loose Joint Butts, Nos. 700, 701, 702, 703	55&10
Japanned Loose Joint Butts, Nos. 704, 706, 708, 709, 710, 711	55&10
Japanned Car Butts, Nos. 712, 714, 716	55&10
Japanned Loose Pin Butts, Nos. 726, 727, 728, 729, 730, 731	55&10
Japanned Loose Pin Butts, No. 732	55& 0
Japanned Parliament Butts, Nos. 734, 735, 736, 738, 739, 740	60&10
Japanned Parliament Butts, Nos. 744, 746	60&10
Japanned Light Reversible Butts, No. 748	35&10
Japanned Light Loose Joint Butts, No. 750	35&10
Japanned Light Narrow Butts, No. 752	30&10
Japanned Light Inside Blind Butts, No. 754	30&10
Japanned Screws, No 756	60&2½
Narrow Butts, No. 800	65
Narrow Loose Joint Butts, No. 802	65
Reversible Butts, No. 804	65
Loose Joint Butts, No. 806	65
Broad Butts, No. 808	65
Table Butts, No. 810	65
Inside Blind Butts, No. 814	65
Back Flaps, Nos. 814, 816	65
P w Door Butts, No. 818	65
Chest Hinges, No. 820	65
Reversible Butts, No 822	60
Extra Light Butts, No. 826	65
Parliament Butts, Nos. 828, 830, 832	65&10
Light Reversible Butts, No. 834	65
Light Loose Joint Butts, No. 836	65
Light American Wardrobe Hinges, No. 837	60
Light Narrow Butts, No. 838	65
Light Narrow Butts, Loose Pin, No. 840	65
Light Inside Blind, Nos. 842, 843	65
Light Inside Blind, Loose Pin, No. 844	65
Light Inside Blind, Edge Holes, No. 846	65
Light Inside Shutter Butts, No. 848	65
Strap and T Hinges, Nos. 900, 902, 904, 906, 908, 910	70
Hinge Hasps and Staples, Nos. 912, 913, 914	70
Crate Hinges and Hasps, Nos. 916, 918, 920	70
Heavy T Hinges, Braced Leaf, No. 922	70
Solid Link Trap Door Hinges and Hasps, Nos. 923, 923½	50&10
Wells' Patent Hinges, Nos. 925, 927	40&10
Hart's Patent Hinges, Nos. 928, 929, 931	40&10
Record's Patent Hinges, No. 999	40&10
Bulk Shutter and Flask Hinges, Nos. 932, 934	10
Rolled Plate and Raised Hinges, Nos. 940, 942	70
Light Strap Trunk Hinges, No. 943	65&10
Hart's Patent Trunk Hinges, Nos. 945, 947	40&10
Japanned Strap and T Hinges, Nos. 952, 954, 956, 958, 960, 962	95
Japanned Strap and T Hinges, Nos. 964, 966, 968, 970	65
Hasps and Staples, Nos. 972, 974, 976, 978	80&10
Hasps and Staples, No. 980, 982, 984	80&10
Japanned Hasps and Staples, Nos. 986, 988, 990	80&10
Step Ladder Joints, No. 992	65
Washers, Standard List, No. 994	4¼¢ ℔
Corner Irons, No. 995	40&10
Corner Braces, No. 997	40&10
Flush Bolts, Nos. 1000, 1001, 1002, 1004, 1005	55&10
Flush Bolts, Nos. 1006, 1008, 1010, 1012, 1014	55&10
Extra Heavy Flush Bolts, Nos. 1016, 1018	40, 10&10
Flush Bolts, Nos. Nos. 1020, 1022	60&7½
Sunk Flush Bolts, Nos. 1026, 1028	30&10
Sunk Flush Bolts, Nos. 1030, 1034, 1036	50&10
Projecting Flush Bolts, No. 1038	50&10
Southern Door Bolts, No. 1046	20&10
Flat Tail Bolts, No. 1048	40
Flat Spring Bolts, Nos. 1050, 1052, 1054	50&10
Canada Bolts, Nos. 1058, 1060, 1062, 1064, 1066	50
Canada Bolts, Nos. 1068, 1070, 1072, 1074, 1076	50
Barrel Bolts, Nos. 1078, 1080, 1081, 1082, 1084	70
Barrel Bolts, No. 1086	70
Square Bolts, Nos. 1088, 1090, 1092, 1094, 1096	60&10
Square Bolts, No. 1098	60&10
Round and Square Neck Bolts, Nos. 1100, 1102	35
Tower Bolts, Nos. 1104, 1106	40
Brass Barrel Bolts, No. 1108	50
Japanned Shutter Bolts, Nos. 1110, 1112	60&10
Brass Knob Shutter Bolts, No. 1114	40&10
T. K. Lock Shutter Bolts, No. 1118	30&10
Steamboat Shutter Fasts, Nos. 1122, 1124	50&10
Wrought Floor Plates and Staples for Square Bolts, Nos. 1126, 1128, 1130, 1132	60&10
Window Shutter Handles, No. 1200	60&10
Japanned Chest Handles (Stanley Works), No. 1206	60, 10&5
Japanned Chest Handles (Beebe), No. 1208	60, 10&10
Japanned Tub Handles, No. 1209	60, 10&10
Galvanized Strap and T Hinges, Nos. 1300, 1302, 1303, 1304, 1306	65, 10&5
Galvanized Strap and T Hinges, Nos. 1300¼, 1302¼, 1303¼, 1304¼	66⅔
Galvanized Strap and T Hinges, No. 1306¼	66⅔
Galvanized Hinge Hasps, No. 1308	65, 10&5
Galvanized Hinge Hasps, No. 1308¼	66⅔
Galvanized Wash Tray Hinges, No. 1312	60
Galvanized Square Back Flaps, No. 1313	60
Galvanized Narrow Butts, No. 1315	60
Galvanized Light Narrow Butts, No. 1317	60
Galvanized Hasps and Staples, Nos. 1314, 1316, 1318, 1320	75&10
Galvanized Chest Handles, Heavy, No 1322	60, 10&5
Galvanized Tub Handles, No 1323	60, 10&10
Galvanized Shutter Bolts, No. 1326	60&10
Galvanized Square Bolts, Extra Heavy, No. 1328	50
Wrought Blind Hinges, Nos. 1600, 1604, in quantities equal to 500 sets each, Hinges and Fasts	5
Wrought Blind Hinges, Nos. 1608, 1612, in quantities equal to 500 sets each, Hinges and Fasts	5
Wrought Blind Hinges, Nos. 1616, 1628, 1600 sets each	7½
Wrought Blind Hinges, Nos. 1624, 1628, 2000 sets each	10&2½
Malleable Blind Hinges, Nos. 1632, 1634, 1636,	10&2½
Wrought Blind Hinges (New York City style), Nos. 1640, 1642, 1644, 1646	30
Malleable Blind Hooks, Nos. 1650, 1654, 1658, 1662, 1666, same discount as 1600 to 1636.	
Stanley's Wire Blind Fasts, No. 1667, in quantities equal to 500 sets each, Hinges and Fasts	5
Security Blind Fasts, No. 1668, in quantities equal to 500 sets each, Hinges and Fasts	5
Boston Pattern Blind Fasts, No. 1672, in quantities equal to 500 sets each, Hinges and Fasts	5
Lock Blind Fasts, Nos. 1673, 1673½, 1000 sets each	7½
Lock Blind Fasts, Nos. 1673, 1673½, 2000 sets each	10&2½
Drop and Pin Blind Fasts, Nos 1674, 1674½	10
Security Screw Blind Fasts, Nos. 1676, 1676½, in lots of 10 gross, 25 per cent	15
Standard Screw Blind Fasts, Nos. 1680, 1680½, in lots of 10 gross, 25 per cent	15
Gravity Screw Blind Fasts, Nos. 1682, 1682½, in lots of 10 gross, 25 per cent	15
Plate Blind Fasts, Nos. 1684, 1684½, in lots of 10 gross, 25 per cent	15
Plate Blind Fasts, No. 1688, in lots of 10 gros , 25 per cent	15
Sweet's Window Springs, No. 1696	15
Sweet's Reversible Sash Lifts, No. 1700	25
Northup's Window Springs, No. 1704	15
Parts of Blind Fasts, &c	net

The city of Baltimore is gaining rapidly in her foreign commerce, chiefly on account of the increase of flour exports from that port, which have steadily gained for three years past, until now she ranks in this respect only second to New York in importance. Prior to 1885 Baltimore exports of flour averaged less than 500,000 barrels a year; in 1885 they jumped up to over 1,000,000 barrels; during 1886 there was an advance to over 1,600,000 barrels, and in 1887 they amounted to 3,078,717 barrels. The gain for the most part is a diversion from New York.

The authorities of Pekin, China, have recently taken a census of the Empire, and as it was for taxing purposes the proneness to disbelieve in the large estimates must be modified accordingly. The figures returned by the village bailiffs make the population 319,383,500, which together with the estimates of five provinces omitted makes the aggregate about 392,000,000. These figures are independent of the population of Corea, Thibet and Kashgar. As the population of India exceeds 250,000,000 the Hindoos and Chinese constitute more than half the entire human race.

To calculate roughly the quantity of water in any given pipe or other cylindrical vessel, it is only necessary to remember that a pipe 1 yard, or 3 feet, long will hold about as many pounds of water as the square of its diameter in inches. Thus: If we have a pipe 20 inches in diameter and 16 feet long, we have simply to square twenty ($20^2 = 400$), and multiply the result by the number of times 3 feet is contained in 16 feet $= 5\frac{1}{3}$ times; hence, $400 \times 5\frac{1}{3} = 2133$ pounds. By increasing the result by 2 per cent., or $\frac{1}{50}$, a more nearly exact figure can be obtained.

ARRANGEMENT OF HARDWARE STORES.

The arrangement of the store of Tallman & McFadden, 1025 market street, Philadelphia, is represented in the accompanying illustrations, Figs. 185–190, Fig. 185

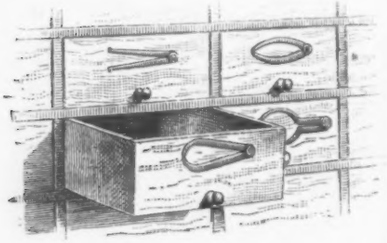


Fig. 186.—Drawers in Shelving.

being a diagram showing the general arrangement and the other illustrations referring to some special features. The store, Fig. 185, is 24½ feet wide by about 200 feet deep, running entirely through the block from Market to Filbert street, the Filbert street entrance being used for the reception of goods. An elevator is located, it will be observed, at either end of the store, the one at the front, or Market street end, being used for passengers and the other for freight. A line of five counters, with sufficient space between, occupies one side of the store, and one of the noticeable features of arrangement is the ample room behind the counters. Much of the space below the counters is occupied with drawers containing either samples or goods in stock. These drawers are opened from the back of the counter. The entire left side of the store upon entering is occupied with shelving extending nearly to the ceiling, the most of which is filled with small drawers sufficiently large to contain goods in original packages. The plan of keeping goods in their original packages has been generally carried out, and the shelving and drawers have been arranged with that in view. The locations of the different goods are in a general way indicated by the lettering on the plan. Fig. 186 illustrates the shelf drawers for containing small goods, these drawers being 5 inches high, 14 inches wide and 16 inches deep, outside measurement. About the middle of the store lengthwise, occupying one-half its width, are the business offices, three in number, a private office, book-keeper's office and office for cashier. These offices are lighted from above by a skylight. One of the striking features in the arrangement of the store is the manner in which Mr. McFadden has located his business desk, a sketch of which is given in Fig. 187, its place in the store being also indicated on the plan. The platform on which the desk stands is 1 foot 8 inches high, thus giving a good view of what is going on in the store.

Ample floor space is devoted to the exhibition of the heavy line of machine tools which the firm are called upon to keep, such as lathes, scroll saws, planers, vises, lathe chucks, &c. Immediately in front of the cashier's office a stairway leads to the basement, where such stock as bolts, screws, washers, rivets, small vises, wrenches, &c., are kept in bins arranged through the middle and on each side. While there is little that is novel in the construction of the bins for holding this stock, they may be described as large pigeon holes, the lower half of the front of each being closed to prevent goods from falling out. They extend in sections almost the length of the basement. At the rear of the basement a machine is in position and ready for use at all times in cutting pipe, shafting, rods, &c., to suit the customers' order.

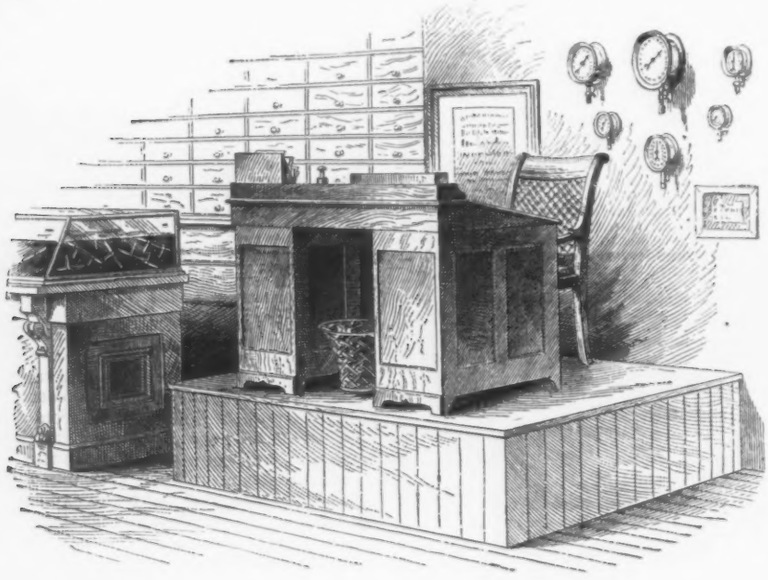


Fig. 187.—Mr. McFadden's Desk.

Some of the minor details of arrangement are shown in Figs. 188, 189 and 190.

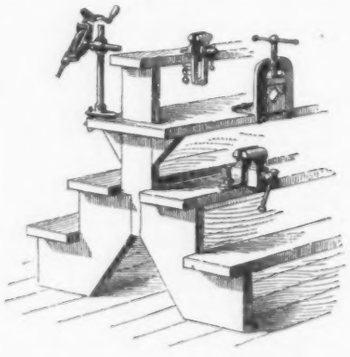


Fig. 188.—Rack for Anvils, &c.

Fig. 188 is a doubled-faced rack which is used for exhibiting vises and other tools of moderate size. This rack is about 4 feet high and 3½ feet wide on the floor. It is

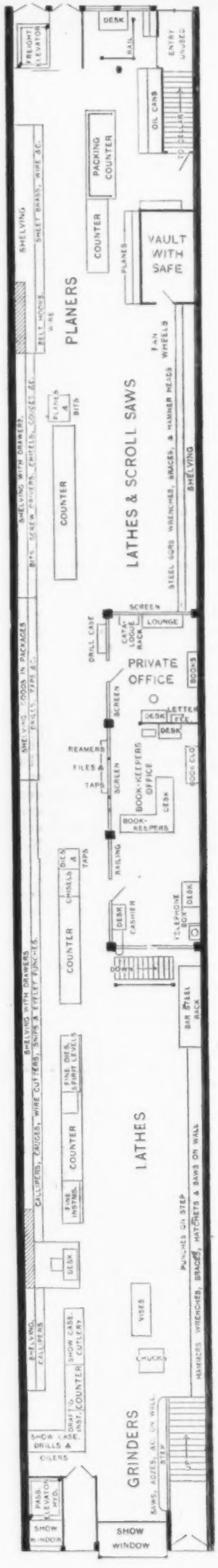


Fig. 185.—Diagram Showing Arrangement of Store of Tallman & McFadden, Philadelphia.

strongly built, and makes a very satisfactory exhibit of the goods. Its location is indicated in Fig. 185. The following figure, 189, illustrates small drawers arranged in the shelving for the accommodation of small tools, the drawers being 3 inches wide and 2 inches high. On their front is marked as indicated the kind and size of goods contained in each. The drawers for Taper Shank drills and other tools that require larger receptacles than those accommodated in the drawers just described are illustrated in Fig. 190. These drawers are 13 inches wide and 2½ inches deep.

Fig. 189.—Small Drawers.

Fig 190.—Drawers for Drills, &c.

The show-windows on Market street are tastefully arranged and well filled with samples, mostly of bright and attractive goods, a ground of black velvet being used to set them off. The interior of the store is finished entirely in light-colored wood, the ceiling and all the edges of the shelving between the drawers being cherry, which affords a pleasant contrast with the face of the drawers, which is of a lighter colored wood. The counters are also in light hard wood finish, and are quite elaborate in style and contain many showcases.

The second floor is used for storing the stock and contains a large quantity of goods, among which are Railroad supplies, Wheelbarrows, Crowbars, Bellows, Axe Handles, &c.

The power required is furnished by a 28-horse power steam-engine with boiler of sufficient capacity to furnish also steam for heating purposes. It also runs a dynamo for furnishing the electric light by which the establishment is illuminated.

This description of an exceptionally complete store, in which a very large stock is carried and an extensive business done, will doubtless be of interest to our readers, but will give them only a partial idea of the convenience and merit of its arrangement.

REFERRED TO OUR READERS.

Barrel and Hoop Iron.—A Hardware firm in New York State desire information as to the best way to keep Barrel and Hoop Iron. They state that they have seen several methods described, but none of them in their judgment are satisfactory.

Belting.—We still have inquiries in regard to the management of Belting, which can doubtless be answered satisfactorily if some in the trade will be kind enough to describe their method.

COPELAND'S IMPROVED NAIL.

W. E. Trufant, Whitman, Mass., is about putting on the market an improved wood wire nail, manufactured under Copeland's patent. This nail is a plain wire nail coated with a cement which consists principally of asphalt, which, when the nail is inserted in the wood, is softened by the heat generatod by friction. This cement is described as flowing into and filling the crevices and pores of the wood, making a direct and complete union between the nail and the wood, thereby causing the nail to hold much more firmly than the plain wire nail, while, at the same time, it is alluded to as preventing moisture from getting in to destroy the wood or to rust the nail. These nails are referred to as having all the advantages of both the cut and the plain wire nail, and as particularly adapted for roofing, fencing and other exposed positions, on account of their holding power and their being water-proof. In most cases Trinidad asphalt is used as a coating, and it is referred to as giving as good results as any coating yet used, while it is not affected by time. When the color of asphalt is an objection a colorless coating can be given or one of any color desired. Mr. Trufant also advises us in regard to a series of tests made at the Watertown Arsenal, December 28, 1887, and January 11, 1888, in which these coated nails were tested in comparison with the plain wire nail and the cut nail. The following statement, in regard to the tests and the inferences drawn from them by Mr. Trufant, will be of interest:

All nails except those in the white oak were driven to within ¼ inch of the head. Those in the white oak were driven about 1¾ inches. In all but two or three instances four nails of each kind and size were tested, resulting in the averages given below, and in all cases but one stick of the same kind of wood was used, the object being to have the conditions exactly the same for the different kinds of nails.

White Pine Stick.

Size.	No. nails in lb. Coated.	Cut.	Plain Wire.	Lbs. reqired to pull nail out. Coated.	Cut.	Plain Wire.	Lbs. per sq. inch of surface in wood. Coated.	Cut.	Plain Wire.
4*d*.....	388	252	394	265	128	98	914	278	238
6*d*.....	271	142	274	312	284	142	736	425	335
8*d*.....	126	86	128	506	581	227	677	518	304
10*d*.....	87	59	88	641	648	259	638	407	258
20*d*.....	35	31	35	1181	957	526	631	402	281
60*d*.....	13	10	13	1900	2025	1077	465	350	264
Spruce.									
10*d*.....	87	59	88	657	652	368	654	410	366
White Oak.									
20*d*.....	35	31	35	999	1000	760	1054	995	804

In the above tests the 20*d* in pine and the 10*d* in spruce were drawn ¼-inch and then pulled out, with the following results:

20*d*.....	35	31	35	1016	518	338
10*d*.....	87	59	88	511	307	204

The tests of nails after they have been started a short distance is very important, as very many nails are started by the frost or rough handling after being driven and it must always be taken into consideration.

From the foregoing summary we obtain the result that in pine, before starting:

Coated Nails.		Cut Nails.	Plain Wire Nails.
1 lb. 4*d*	equals	3.19 lbs.	2.65 lbs.
" 6*d*	"	2.83 "	2.94 "
" 8*d*	"	1.27 "	2.19 "
" 10*d*	"	1.45 "	2.44 "
" 20*d*	"	1.39 "	2.10 "
" 60*d*	"	1.21 "	1.76 "

In Spruce:

1 lb. 10*d* coated nails equals 1.48 lbs. cut nails, 1.76 lbs. plain wire nails.

In Oak:

1 lb. 20*d* coated nails equals 1.12 lb. cut nails, 1.31 lbs. plain wire nails.

Throwing out the test in White Oak we have—

Before starting:

1 lb. coated nails equals 1.68 lbs. cut nails, 2.05 lbs, plain wire nails.

After being started:

1 lb. coated nails equals 2.33 lbs. cut nails, 2.73 lbs. plain wire nails.

That is, with cut nails at $2.00 base, coated wire nails should be $3.36, and after both nails have been started coated nails would be worth $4.66 to give the same result for the money. With wire nails at $3.00 base, coated nails should be $6.15 before starting, and after starting would be worth $8.19.

A license of incorporation under the laws of Illinois has been issued to the Tight-Cap Roof and Corrugated Iron Company, of Chicago. The authorized capital is $300,000. The incorporators named are Allen C. Durborough, Robert J. Randolph, Wyllys A. Abbett, Michael Hyland and Thomas T. Loomis. This is an entirely new enterprise, backed by men of capital and based on the plans of practical roofers of long experience. Machinery of special design is already under construction, and operations are expected to begin in March, but the promoters of the company are not fully prepared as yet to make their plans public.

Railroad Earnings.

The annual report of the Buffalo, Rochester and Pittsburgh Railroad contains the following:

According to a contract with the coal shippers over the road the freight received was to be regulated by the price which coal sold for at Buffalo and Rochester. The average price received as freight to Buffalo was 82 $\frac{2}{100}$ cents and to Rochester 92 $\frac{31}{100}$ cents. The contracts for the sale of coal are made for one year, generally from May 1. At the time these contracts were entered into the price of coal was considerably lower than it is at present, and it was agreed to charge as freight from January 1 to May 1 $1 per ton to Buffalo, $1.15 to Rochester, being 17 $\frac{98}{100}$ cents more to the former place and 22 $\frac{69}{100}$ cents to the latter than was received on the portion of the contracts delivered during last year. It is only after the 1st of May next that the full benefit of the large rise in the price of coal which has taken place since last year will be felt. The company's coal was sold at the average price of $1.64 $\frac{49}{100}$ per ton at Buffalo: the price at present is fully 50 cents per ton higher. As, notwithstanding this considerable rise, bituminous coal is still very low compared to anthracite, which sells at $4.50, and lower than at any other shipping port, there is every probability of present prices being maintained. They are sufficiently high to yield with the increasing tonnage very satisfactory results. The traffic statistics were as follows:

	1887.	1886.		P.c
No. tons coal & coke carried.	1,499,387	935,752	.....	60.2
No. tons coal & coke carried 1 mile.	209,451,429	122,297,067	I.	87,224,362 71.3
No. gen. frt. carried	455,153	390,332	I.	64,821 16.6
No. gen. frt. carried one mile	31,916,775	27 492,476	I.	4,424,299 16.0

Averages.

	Earnings. Cents.	Expenses, Cents.	Profit, Cents.
Per ton coal carried.. ...	73.77	57.04	16.73
Per coal trains one mile..	177.83	137 49	40.34
Per ton coke one mile...	0.538	0.416	0.122
Per ton coke carried.....	119.65	64.68	54.97
Per coke train per mile..	291.81	157.75	134.06

The Beechtree mines of the Rochester and Pittsburgh Coal and Iron Company produced during the year 217,233 tons of coal. The Wallston mines have produced 542,654 tons of coal, of which 216,374 tons were shipped and 384,585 tons used for coke. There are now 700 coke ovens in blast at these mines; 4645 acres have been added during the year.

During a recent visit to the Otto Gas Engine Works (Schleicher, Schumm & Co.), at Philadelphia, Pa., we noticed an improvement in the design of the engine cylinders which is of some interest. Perhaps it has occurred to but few users of gas engines that during cold weather the danger of freezing of the water in the cooling jackets should be carefully guarded against, the water admitting of being drained off by suitably placed cocks. Should this be overlooked and freezing actually take place, a ruptural jacket is the natural consequence. The improvement to which we refer admits of exchanging the jackets in case of such breakage, and the expense of elaborate repairs and even of a new cylinder is avoided. With the old design when a break occurred, the crack had to be calked and iron bands put around the cylinder. The English makers have no provision for this on their engines, since with a milder climate fracture due to frost rarely occurs. They provide for interchange of cylinders in case of wear, but, as Mr. Schleicher informs us, he prefers reboring the old cylinders.

Recent Legal Decisions.

FIXTURES — MACHINERY ATTACHED WITH SCREWS AND BELTING.

W. & Co., who were makers of a flouring mill, consigned a mill to themselves at Grand Rapids, Mich., in care of P., and he was to test it in a mill he (P.) was altering into a first-class mill for other persons, who afterward formed the Grand Rapids Flouring Mill Company. P. put the machine in position for use; it stood on four legs, and was attached by screws to the floor and connected by belts and pulleys to the main shafting by which the mill was operated. W. & Co. sent to Grand Rapids to learn how the test resulted, and there learned that the company held the machine as its own. The makers insisted that the officers knew that P. was acting as their agent only, but the company replied that while its officers, as individuals, before the company was formed, might have known about the agency, yet when the company bought the mill and it was conveyed to it the machine was found attached to the mill property as a fixture, and, therefore, they claimed it as part of the mill itself. W. & Co. then sued for the conversion of the machine and the company was defeated and carried the case—Walker *vs.* Grand Rapids Flouring Mill Company—to the Supreme Court of Wisconsin, where the judgment was affirmed. Judge Lyon, in the opinion, said: "The rule or test for determining whether articles of machinery are fixtures are these: 1. There must be actual physical annexation to the realty; 2. there must be an application or adaptation to the use or purpose to which the realty is devoted; there must be an intention on the part of the person making the annexation to make a permanent annexation to the freehold. The third requirement of the rule is wanting in this case. The machine was not supplied to P. by the plaintiffs to be made a permanent accession to the freehold unless some person interested should thereafter purchase it, and there is no evidence that P. had any such intention. But little importance is given to the mere fact of attachment of machinery to the freehold so long as the identity of the property remains and its capacity to be removed and used elsewhere is not destroyed. The principal consideration in such cases is the intention of the party putting in the machinery."

PATENT—PAROL AGREEMENT TO ASSIGN.

S. and H. were interested in a patent right, and they had a new device which they thought would improve the patent, for which they wanted to get out a patent. H., by a verbal agreement, went to Washington to procure the letters patent in his own name, he then to assign to S. the interest covering the State in which he was seeking the patent, H. having different State, the expenses of the journey, stay and counsel fees to be divided between S. and H. The matter was carried through, and S. paid his half of the expenses to H., but the latter refused to make the assignment. A suit was brought to enforce the agreement, when H. set up in defense the Revised Statutes of the United States, section 4898, which declares that patents "shall be assignable in law by an instrument in writing." But the court held that the verbal agreement was good in equity, and the case—Searle *vs.* Hill—was taken to the Supreme Court of Iowa, where the judgment was affirmed. Judge Reed, in the opinion, said: "This provision of the statute merely prescribes the means or instrument by which the title may be passed. It does not forbid the making of a parol executory contract for the sale of the property. A party contracts by parol for the sale and conveyance of real estate and receives the stipulated price, but the title cannot be passed except by an instrumen in writing, and courts of equity have always afforded relief when the conveyance has been refused by compelling the execution of the instrument. If the defendant here refuses to make the assignment under a recent decision the court will direct one of its officers to make the assignment, which will be a valid instrument."

SALE—WARRANTY—VALUE OF GOODS STATED.

McK. sold to McI. a quantity of fertilizer, which he represented to the buyer was worth $38 a ton, but it was found that it was worth but half that price. On a refusal to pay more than half the bill, an action was brought for the full amount, and the defense was set up that fixing the value of the fertilizer was a warranty as to quality, but the court overruled this defense and plaintiff had judgment. Defendant carried the case—McKinnon *vs.* McIntosh—to the Supreme Court of North Carolina, where the judgment was overruled. Judge Davis, in the opinion, said: "The defendant had the right to have the question whether the force and effect of the affirmation of the plaintiff in regard to the value of the fertilizer did not constitute a warranty of the quality, go to the jury. If the vender represents an article as possessing a value which, upon proof, it does not possess, he is liable on a warranty expressed or implied, although he may not have known such an affirmation to be false, if such representation was intended, not as a mere expression of an opinion, but the positive assertion of a fact upon which the purchaser acts, and this is a question for the jury. We think there was error in not submitting to the jury the issue raised by the answer as to this warranty, and we must send the case back for a new trial."

CONTRACTS FOR REBATES ON SHIPMENTS.

A very important decision was rendered on the 25th ult. by Justice Gresham, of the United States Circuit Court, at Chicago, in the Central Iowa Railroad foreclosure case. A year or two ago Bartlett & Co., extensive grain shippers, made a contract in Iowa with the Central Iowa Railroad for certain rebates on their shipments. When the foreclosure proceedings were begun they had a claim of some $3000 for such rebates, and filed an intervening petition to have the receiver of the road directed to pay it out of the proceeds of a sale and as against the mortgagees. The Judge refused to allow it on the ground that the statutes of Illinois prohibit discrimination by railroads in this or any other way. Though the contract was made in Iowa it was to be enforced in Illinois, and was illegal under the law, no matter where made. Although the case was expressly based on the Illinois law, yet it seems the principle of the illegality of rebates can be sustained under the common law irrespective of statutory provisions. As far as known this question has never been decided before. The railroad managers held that the Interstate law prohibiting the payment of rebates, &c., did not apply to State traffic, and consequently the system of paying rebates, drawbacks, &c., on freight rates between points in the same State has never been stopped.

A correspondent at El Paso, Tex., informs us that during the close of last year the Mexican Ore Company, which is identical with the Kansas City Smelting and Refining Company and the El Paso Smelting Company, received daily about 200 tons of Mexican ore, averaging from 35 to 40 per cent. of lead and 25 to 30 ounces of silver. We understand that the custom-house valuation of 40 cents per unit makes the lead value of this ore about $16, while the silver is, of course, higher. Thus this ore is brought in duty free as silver ore. The El Paso Smelting Company has during the year built four large smelting furnaces, and there is another concern putting up works at the same point. Besides this, considerable Mexican lead ore goes to St. Louis, Kansas City, Omaha, Denver and Pueblo.

It is curious to observe how great newspapers gravely attack the anthracite coal companies as monopolists intrenched behind the tariff on coal when there is not a single deposit of anthracite worthy of the name in the world whose competition the producers might feel. At one time, when bituminous coal was comparatively dear, the seaboard manufacturers used anthracite largely for ralsing steam, but since, through domestic competition, bituminous coal has been cheapened considerably, the field for anthracite for manufacturing purposes has been much narrowed. The duty on bituminous coal has a very remote bearing on the anthracite coal trade, even if it be admitted that it does enable producers of bituminous coal to exact higher prices than those which might be obtained if foreign coal were allowed to enter free. As a matter of fact the struggle for business among the operators on the Clearfield, Snow Shoe, Cumberland, Flat Top and other districts serving tidewater markets has been so keen that, considering the cost of transportation to tidewater and its carriage by sea, the prices have been low for years.

Another meeting of the representatives of the natural gas companies doing business outside of Pittsburgh was held at the Monongahela House, in that city, Thursday evening, the 26th ult. Only eight of the 14 companies in the pool were represented. These were the Bridgewater, Shenango, Mahoning Valley, Wheeling, Bellevue, West Virginia and the Royal, of Steubenville. The field committee in the Beaver district presented an informal report recommending the adoption of a uniform lease, and also a limit to the number of wells and mains and an agreement which would prevent the mains of one company interfering with those of any other in the pool. The report was received and the meeting adjourned for two weeks.

A Western paper explains how a genuine blizzard originates somewhere in the region of the North Pole and sweeps across British North America, through a sort of funnel flanked by the Laurentian Mountains on one side and the Huronians on the other, rising in some parts 4000 feet, while on the Saguenay River the gorges form sheer cliffs 1500 feet high. The blizzard strikes against the western limit of this rocky barrier and is deflected so that in Wisconsin, Eastern Minnesota, Michigan and Illinois its force is broken. From that point, and the Rockies and Sierras further south, there is an unbroken plateau to the Gulf of Mexico, where the blizzard disports itself un challenged. South of the mountains the Arctic currents are less severe. Manitoba is only a mid-station in its career.

The steel steam ferry-boat, Robert Garrett, built for the Staten Island Rapid Transit Company, was launched recently at the Columbia Iron Works and Dry Dock, in Baltimore. She is built of ½-inch steel plates, and 250 feet long over all, and 64 feet beam over guards, and will have a draft of 7 feet 10 inches. She will have inclined compound engines of 1500 horse power and will make 15 miles per hour. The E. Wiman, another steamer for the same company, will be launched about six weeks hence.

A new corporation in Wisconsin is the E. Kunert Mfg. Company, of Watertown; object, to conduct a brass foundry; capital, $50,000; incorporators, Ernest Kunert, Gustavius May, William Voss and Henry Mulwerger.

CURRENT HARDWARE PRICES.

FEBRUARY 1, 1888.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

Ammunition.

Caps, Percussion, ₩ 1000—
Hicks & Goldmark's
F. L. Waterproof, 1-10's.....50¢
E. B. Trimmed Edge, 1-10's.....65¢ } dis 25@25&
E. B. Ground Edge, Central Fire, 1-10's. 70¢ } 7½ %
Double Waterproof. 1-10's.....$1.40
Musket Waterproof, 1-10's.....62¢ @ 53¢
G. D.....28¢
S. B.....30¢
Union Metallic Cartridge Co.
F. C. Trimmed.....50¢
F. L. Ground.....65¢ } dis 25@
Cen. Fire Ground.....70¢ } 25&
Double Waterproof.....$1.40 } 7½ %
Double Waterproof, in 1-10's.....$1.40
S. B. Genuine Imported.....45¢
Eley's E. B.....54¢ @ 56¢
Eley s D Waterproof, Central Fire.....$1.60

Cartridges—
Rim Fire Cartridges.....dis 50&5&2 %
Rim Fire Military Cartridges.....dis 15&2 %
Cen. Fire Cartridges, Pistol and Rifle...dis 25&5&2 %
Cen. Fire Cartr., Military & Sporting....dis 15&5&2 %
Blank Cartridges, except 22 and 32 cal., an additional 10 % over above discounts.
Blank Cartridges .22 cal.....$1.75, dis 2 %
Blank Cartridges, 32 cal.....$3.50, dis 2 %
Primed Shells and Bullets.....dis 15&5&2 %
B. B. Caps, Round Ball.....$1.75, dis 2 %
B. B. Caps, Conical Ball, Swaged.....$2.00, dis 2 %

Primers—
Berdan Primers all sizes, and B. L. Caps (for Sturtevant Shells).....$1.00, dis 2 %
All other Primers, all sizes.....$1.20 dis 2 %

Shells—
First quality, 4, 8, 10 and 12 gauge....dis 25&10&2 %
First quality, 14, 16 and 20 gauge (¥10 list), dis 30&10&2 %
Star, Club, Rival and Climax Brands, } 10-gauge, ¥9 list } dis 33⅓&10
12-gauge, ¥8 list } 2 %
Club, Rival and Climax Brands, 14, 16 and 20 gauge.....dis 30&10&2 %
Selbold's Combination Shot Shells.....dis 15&2 %
Brass Shot Shells, 1st quality.....dis 60&2 %
Brass Shot Shells, Club, Rival & Climax...dis 65&2 %

Shells Loaded—
List No. 19, 1887.....dis 20 & 10 %

Wads—
U. M. C. & W. R. A.—B. E., 11 up.....$2.00
U. M. C & W. R. A.—B. E., 9&10.....2.30
U. M. C. & W. R. A.—B. E., 7&8.....2.60 } dis 20&2 %
U. M. C. & W. R. A.—P. E., 11 up.....3.10
U. M. C. & W. R. A.—P. E., 9&10.....4.00
U. M. C. & W. R. A.—P. E., 7&8.....4.90
Eley's B. E., 11 up.....$1.75
Eley's P. E., 11 @ 20.....$2.80

Anvils.—Eagle Anvils....¥ ℔ 10¢, dis 20 @ 20&5 %
Wright's.....9½¢
Armitage's Mouse Hole.....9¢
Armitage Mouse Hole, Extra.....11½¢
Trenton.....9½¢@9½¢
Wilkinson's.....9½¢@10¢
J. & Riley Carr, Patent Solid.....11@11½¢

Anvil Vise and Drill—
Millers Falls Co.....$18.00, dis 20 %
Chenev Anvil and Vise.....dis 25 %
Allen Combined Anvil and Vise.....$3, dis 40&10 %
Moore & Barnes Mfg. Co.....dis 33⅓ %

Augers and Bits.
Douglass Mfg. Co.....
New Haven Copper Co.....
Wm. A. Ives & Co.....
Humphreysville Mfg. Co.....
French, Swift & Co. (F. H. Beecher).....dis 70@70&5 %
Connecticut Valley Mfg. Co.....
Cook's, Douglass Mfg. Co.....dis 55 %
Cook's, New Haven Copper Co...dis 50&10@50&10&5 %
Ives' Circular Lip.....dis 60 %
Patent Solid Head.....dis 30 %
C. E. Jennings & Co., No. 10, extension l'p.....dis 40 %
C. E. Jennings & Co., No. 30.....dis 60 %
C. E. Jennings & Co., Auger Bits, in fancy boxes, ¥ set, 32¼ quarters, No 5, $5; No. 3, $....dis 20 %
Lewis' Patent Single Twist.....dis 45 %
Russell Jennings' Augers and Bits.....dis 25 %
Imitation Jennings' Bits (new list).....dis 60@6⅔&5 %
Pugh's Black.....dis 20 %
Car Bits.....dis 50&10@60 %
L'Hommedieu Car Bits.....dis 15&10 %
Forstner Pat. Auger Bits.....dis 10 %

Hollow Augers—
Ives' } dis 25&10 @ 25&10&5 %
French, Swift & Co. }
Douglass' }
Bonney's Adjustable ¥ doz. $48.....dis 40&10 %
Stearns'.....dis 20&10 %
Ives' Expansive, each $4.50.....dis 50&10 %
Universal Expansive, each $4.50.....dis 20 %
Wood's.....dis 25 @ 25&10 %

Expansive Bits—
Clark's small, $18; large, $26.....dis 35 @ 35&5 %
Ives' No. 4, per doz., $60.....dis 35 @ 40 %
Swan's.....dis 40 %
Steer's, No. 1, $26; No. 2, $22.....dis 35 %
Stearns' No. 2, $48.....dis 20 %

Gimlet Bits—
Common.....¥ gross $2.75 @ $3.25
Diamond.....¥ doz. $1.10, dis 25&10 %
"Bee".....dis 25 @ 25&5 %
Double Cut, Shepardson's.....dis 45 @ 45&5 %
Double Cut, Ct. Valley Mfg. Co.....dis 30&10 %
Double Cut, Hartwell's, ¥ gro.....$5.25
Double Cut, Douglass'.....dis 40&10 %
Double Cut, Ives'.....dis 60 @ 60&5 %

Bit Stock Drills—
Morse Twist Drills.....dis 50&10&5 %
Standard.....dis 50&10&5 %
Cleveland.....dis 50&10&5 %
Syracuse, for metal.....dis 50&10&5 %
Syracuse, for wood (wood list).....dis 30 @ 30&5 %
Williams' or Holt's, for metal.....dis 50&10&10 %
Williams' or Holt's, for wood.....dis 40&10 %

Ship Augers and Bits—
L'Hommedieu's.....dis 15&10 %
Watrous's.....dis 15&10 %
Snell's.....dis 15&10 %
Snell's Ship Auger Pattern Car Bits.....dis 15&10 %

Awl Hafts.
Sewing, Brass Ferrule.....$3.50 ¥ gross—dis 45&10 %
Patent Sewing, Short.....$1.00 ¥ doz—dis 40&10 %
Patent Sewing, Long.....$1.20 ¥ doz.—net
Patent Peg, Plain Top.....$10.00 ¥ gross—dis 45&10 %
Patent Peg, Leather Top....$12.00 ¥ gross—dis 45&10 %

Awls, Brad Sets, &c.
Awls, Sewing, Common.....¥ gross $1.70—dis 35 %
Awls, Shouldered Peg....¥ gross $2.45—dis 40@40&10 %
Awls, Patent Peg.....¥ gross 63¢—dis 40@40&10 %
Awls, Shouldered Brad.....$2.70 ¥ gross—dis 35 %
Awls, Handled Brad.....$7.50 ¥ gross—dis 45 %
Awls, Handled Scratch.....$7.50 ¥ gross—dis 35&10 %
Awls, Socket Scratch.....$1.50 ¥ doz—dis 25 @ 30 %

Awl and Tool Sets.
Aiken's Sets, Awls & Tools, No. 20, ¥ doz. $10—dis 50&10 %
Fray's Ad Tool Hdls., Nos. 1, $12; 2, $18.; 3. $12; 4, $9. dis 25@25&10 %
Miller's Falls Adj. Tool Hdls., Nos. 1, $12; 2, $18. dis 25 %
Henry's Combination Haft.....¥ doz. $6
Brad Sets, No. 42, $10.50. No. 43, $12.50...dis 70&10&5 %
Brad Sets, Stanley's Excelsior, No. 1, $7.50. }
Brad Sets, Stanley's Excelsior, No. 2, $4.00. } dis 30&10 %
Brad Sets, Stanley's Excelsior, No. 3, $5.50. }

Axes.
Makers' and Special Brands—
First quality.....¥ doz. $6.50 @ $6.75
Others.....¥ doz. $5.75 @ $6

Axle Grease.
Fraser's, in bulk.....Keg ¥ ℔, 4¢; Pail, ¥ ℔, 5¢ net
Frasers, in boxes.....¥ gross $9.50
Dixon's Everlasting, in bxs., ¥ doz., 1 ℔: $1.20; 2 ℔, $2
Dixon's Everlasting.....10-℔ pails, each, 85¢
Lower grades, special brands.....¥ gro $5.50 @ $7

Axles.—No. 1, 4¢ @ 4¼¢; No. 2, 5¼ @ 5½¢.
Nos. 7 to 18.....dis 40&10 @ 50 %
Nos. 19 to 22.....dis 60&10 @ 60&10&10 %
National Wrought Steel Tubular Self-Oiling:
Standard Farm (1 to 5) and Special Farm (A1 to A5)
Less than 10 sets.....dis 33⅓ %
Over 10 sets.....dis 33⅓&5 %
X Strong Exp. (6 to 9), & XX Strong Truck (10 to 16):
Less than 10 sets.....dis 10 %
Over 10 sets.....dis 10&5 %

Bag Holders.
Sprengle's Pat., ¥ doz $18.....dis 60 %
Balances.—Spring Balances.....dis 50 %
Common 24 ℔.....¥ doz., $1.50—dis 50 %
Chatillon's Spring Balances.....dis 50 %
Chatillon's Circular Spring Balances.....dis 60 %

Bells.
Hand—
Light Brass.....dis 70&10 %
Extra Heavy.....dis 60&10 %
White Metal.....dis 60&10&10 %
Silver Chime.....dis 25&10&5 %
Globe (Cone's Patent).....dis 25&10 @ 35 %
Door—
Gong, Abbe's.....dis 25&10 @ 35 %
Gong, Yankee.....dis 40&10 %
Gong, Barton's.....dis 40&10 @ 50 %
Crank, Taylor's.....dis 25&10 %
Crank, Brooks'.....dis 50&10&2 %
Crank, Cone's.....dis 10 %
Crank Connel's.....dis 20&10 %
Lever, Sargent's.....dis 60&10 %
Lever, Taylor's Bronzed or Plated.....net
Lever, Taylor's Japanned.....dis 25&10 %
Lever, R. E. ¥ Co.'s.....dis 50&10&2 %
Pull, Brook's.....dis 50&10&2 %
Pull Western.....dis 25&10 %
Cow—
Common Wrought.....dis 60&10 %
Western.....dis 20&10 %
Western, Sargent's list.....dis 70&10 %
Kentucky "Star".....dis 20&10 %
Kentucky, Sargent's list.....dis 70&10 %
Dodge, Genuine Kentucky, new list..dis 70@70&10 %
Texas Star.....dis 50&10 @ 50&10&5 %
Call.....dis 40@40&5 %
Farm Bells.....¥ ℔, 2½¢ @ 3¢
Steel Alloy Church and School Bells.....dis 40 %

Bellows.—Blacksmiths'.....dis 60&10&5 @ 60 %
Molders'.....dis 40&10 @ 50 %
Hand Bellows.....dis 4 ½10 @ 50 %

Belting, Rubber.
Common Standard.....dis 75 %
Standard.....dis 70&5 %
Extra.....dis 60&10 %
N. Y. B. & P. Co., Standard.....dis 60&5&5 %
N.Y.B.&P Co., Extra Standard.....dis 50&10&5 %

Bench Stops.
Morrill's.....¥ doz $9—dis 50 %
Hotchkiss's.....¥ doz $5.00—dis 10 @ 10&10 %
Weston's, per doz No. 1, $10: No. 2, $9...dis 25&10&5 %
McGill's.....¥ doz $3—dis 10 %

Bits.—Auger, Gimlet Bit Stock, Drills, &c., see Augers and Bits.

Bit Holders.
Extension, Barber's.....¥ doz $15.00—dis 40 @ 40&10 %
Extension, Ives'.....¥ doz $20.00—dis 60&5 @ 60&10 %
Diagonal.....¥ doz $24.00—dis 40 %
Angular.....¥ doz $24.00—dis 40&5 %

Blind Adjusters.
Domestic.....¥ per doz $3.00—dis 33⅓ %
Excelsior.....¥ doz $10.00—dis 50&10&2 %
Washburn's Self-Locking.....dis 20 @ 20&10 %

Blind Fasteners.
Mackrell's.....¥ doz pairs, $1.00—dis 20@20&10 %
Van Sand's Screw Pattern.....$15 ¥ gro.—dis 60&10 %
Van Sand's Old Pattern.....$15 ¥ gro.—dis 55&10 %
Washburn's Old Pattern.....$9 ¥ gro. net
Merriman's.....new list, net
Austin & Eddy No. 2008.....$9 ¥ gro. net
Security Gravity.....$9 ¥ gro. net

Blind Staples.
Barbed, ½ in. and larger.....¥ ℔ 8 @ 8½¢ net
Barbed, ⅝ in.....¥ ℔ 9 @ 9½¢ net

Blocks.
Ordinary Tackle, list April 17, '85.....dis 40 %
Cleveland Block Co., Mal. Iron.....dis 50 %

Bolts.
Door and Shutter—
Cast Iron Barrel, Square, &c.....dis 70 @ 70&10 %
Cast Iron Shutter Bolts.....dis 70 @ 70&10 %
Cast Iron Chain (Sargent's list).....dis 65&10 %
Ives' Patent Door Bolts.....dis 55 %
Wrought Barrel.....dis 70 @ 70&10 %
Wrought Square.....dis 70 @ 70&10 %
Wr't Shutter, all Iron, Stanley's list.....dis 60&10 %
Wr't Shutter, Brass Knob, Stanley's.....dis 40&10 %
Wrought Shutter, Sargent's list.....dis 60&10 %
Wrought Sunk Flush, Sargent's list.....dis 55&10 %
Wrought Sunk Flush, Stanley's list....dis 40&10&5 %
Wrought B.K. Flush, Com'n Stanley's list. dis 55&10 %

Carriage—
Com. list June 10, '84.....dis 70&10&3 %
Genuine Eagle, list Oct., '84.....dis 75 @ 75&5 %
Phila. pattern, list Oct. 7, '84...dis 75&10@75&10&5 %
R. B. & W., old list.....dis 70 %

Tire—
Common, list Feb. 28, 1883.....dis 65&10 %
P. C. B. & N. Co., Empire, list Feb. 28, 1883. dis 65&10 %
P. C. B. & N. Co., Philadel., list Oct. 84.....dis 82½ %
F.C.B.&N.Co., Keystone, Phil. list, Oct. '84.....dis 80 %
P.C.B.&N.Co., Norway, Phil. list, Oct. '84. dis 75&10 %
Am. S. Co., Norway, Phil., list Oct. 16, '84 ..dis 75&10 %
Am. S. Co., Eagle, Phil., list Oct. 16, '84.....dis 80 %
Am. S. Co., Philadel. list, Oct. 16, 84.....dis 82½ %
Am. S. Co., Bay State, list Feb. 28, '83.....dis 65&10 %
R. B. & W., Philadel. list Oct. 16, 1884.....dis 82 %
R. & E. Mfg. Co.....dis 65 %

Stove and Plow—
Stove.....dis 62½ %
Plow.....dis 60&5 %
Am. S. Co. Stove, Annealed.....dis 62½ %
R. B. & W., Plow.....dis 55 %
R. B. & W., Stove.....dis 62½ %
R. & E. Mfg. Co., Stove.....dis 62½ %
Machine.....dis 75@75&5 %
Bolt Ends.....dis 75&75&5 %

Borax......¥ ℔ 9½@10½¢

Boring Machines.

Without Augers.	Upright.	Angular.
Douglas	$5.50	$6.75.....dis 50 %
Snell's, Rice's Patent	5.50	6.75.dis 40&10&10 %
Jennings	5.50	6.75.dis45@45&10%
Other Machines	2.35	2.75.....net
Phillips' Pat., with Augers	7.00	7.50.....net

Bow Pins
Humason, Beckley & Co.'s, Nos 1 and 2—dis 60&10 @ 60&10&5 %
Humason, Beckley & Co.'s other Nos..dis 70 @ 70&10 %
Sargent & Co.'s.....$17 and $18, dis 60&10 %
Peck, Stow & W. Co.....dis 50&10 @ 50&10&5 %

Braces.
Backus, Nos. 110 to 114 and 31 to 38..dis 60&5@60&10%
Backus, Nos. 6, 8, 12, 14.....dis 60&10&5 %
Backus, Nos. 16, 18, 20, 29, 7, 9, 11.....dis 70&10&5 %
Barber's, Nos. 10 to 16.....dis 50 %
Barber's, Nos. 30 to 33.....dis 50 %
Barber's, Nos. 40 to 63.....dis 50&10 %
Barker's, Nos. 8, 10 and 12.....dis 75&10@80 %
Barker's, Plated, Nos. 8, 10 and 12.....dis 65&10@70 %
Osgood's Ratchet.....dis 40&10@50 %
Spofford's.....dis 50&10 %
Ives' New Haven Novelty.....dis 70 @ 70&5 %
Ives' New Haven Ratchet.....dis 6..&5 @ 60&10 %
Ives' Barber Ratchet.....dis 60&5 @ 60&10 %
Ives' Barbers.....dis 60&5 @ 60&10 %
Ives' Spofford.....dis 60&5 @ 60&10 %
Common Ball, American.....$1.10 @ $1.15
Bartholomew's, Nos. 25, 27, 30.....dis 50&10@60&5 %
Bartholomew's, Nos. 117 118, 119.....dis 70 @ 70&5 %
Amidon's Barker's Imp'd Plain.....dis 75&10 @ 80 %
Amidon's Barker's Imp. Nickeled.....dis 65&10 @ 70 %
Amidon's Ratchet.....dis 75&10 @ 80 %
Amidon's Eclipse Ratchet.....dis 60 %
Amidon's Globe Jawed.....dis 40&40&10 %
Amidon's Corner Brace.....dis 40 @ 40&10 %
Amidon's Universal.....8 in., $2.10: 10 in., $2.25
Amidon's Buffalo Ball.....$1.10 @ $1.15
P. S. & W.....dis 50&10 %

Brackets.
Shelf, plain, Sargent's list.....dis 55&10 @ 55&10&10 %
Shelf, fancy, Sargent's list.....dis 60&10 @ 60&10&10 %
Reading, plain.....dis 60&10 @ 60&10&5 %
Reading, Rosette.....dis 60&10 @ 60&10&10 %

Bright Wire Goods.—.....dis 75&10&10@— %

Broilers.	Inch.	9	10	9 x 11
Henis' Self-Basting..	Per doz.	$4.50	5.50	6.50

Buckets.—See Well Buckets and Pails.

Bull Rings.—Union Co. Nut.....dis 55 %
Sargent's.....dis 66⅔&10 @ 70&5 %
Hotchkiss' Flow list.....dis 30 %
Humason, Beckley & Co.'s....dis 70&10 @ 70&10&5 %
Peck, Stow & W. Co.'s.....dis 50&10 @ 50&10&10 %
Elirich Hdw. Co., White Metal, low list.dis50@50&10 %

Butcher's Cleavers.
Humason & Beckley Mfg. Co.....dis 30&5 @ 40 %
Bradley's.....dis 25 @ 30 %
L. & I. J. White.....dis 20&5 %
Beatty's.....dis 40 @ 40&5%

1	2	3	4	5	6	7	8
$16.50	19.00	21.50	24.00	27.00	30.00	33.50	36.50

New Haven Edge Tool Co.'s.....dis 40 %

Butts.
Brass—
Wrought Brass.....dis 70&5 @ 75 %
Cast Brass, Tiebout's.....dis 40 %
Cast Brass, Corbin's Fast..dis 33⅓&10@33⅓&10&10 %
Cast Brass, Loose Joint....dis 33⅓&10@33⅓&10&10 %

Cast Iron—
Fast Joint, Narrow.....dis 50&10 %
Fast Joint, Broad.....dis 55&10 %
Loose Joint.....
Loose Joint, Japanned.....
Loose Joint, Jap. with Acorns.....
Parliament Butts.....
Mayer's Hinges.....
Loose Pin, Acorns.....
Loose Pin, Acorns, Japanned.....
Loose Pin, Acorns, Jap, Pltd. Tips.....
} dis 66⅔&10 %

Wrought (Steel)—
Fast Joint Narrow.....dis 65&10@70 %
Fast Joint, Lt. Narrow.....dis 65&10@70 %
Fast Joint, Broad.....dis 65&10@70 %
Loose Joint, Broad.....dis 65&10@70&5 %
Table Butts, Back Flaps, &c.....dis 65&10@70 %
Inside Blind, Regular.....dis 65&10@70 %
Inside Blind, Light.....dis 65&10@70 %
Loose Pin, Wrt.....dis 65&10@70&5 %
Loose Pin, Light.....dis 65&10@70&5 %
Bronsed Wrought Butts.....dis 40@40@10 %

Calipers.—See Compasses.

Can Openers.
Messenger's Comet.....¥ doz $3.00, dis 25 %
American.....¥ gross $3.00
Duplex.....¥ doz 25¢, dis 15 @ 20 %
Lyman's.....¥ doz $3.75, dis 20 %
No. 4, French.....¥ doz $2.25, dis 55 @ 60 %
No. 5, Iron handle.....¥ gross $6.00, dis 45 @ 50 %
Eureka.....¥ doz $2.50, dis 10 %
Sardine Scissors.....¥ doz $7.00, dis 55 %
Star.....¥ doz $5.00, dis 25&5 %
Sprague, No. 1 $2; 2, $; 3, $2.50.....dis 50&10&10 %

World's Best, ₱ gross, No. 1, $12.00; No. 2, $24.00, No. 3, $36.00.....dis 50&10 %
Universal.....₱ doz $3.00, dis 35&5 %
Domestic.....₱ doz $2.50, dis 45 %
Champion.....₱ doz $2.00, dis 50 %

Cards.
Horse and Curry.....dis 10 @ 10&10 %
Cotton.....New list, Aug., 1883, dis 10 %
Wool..... " " " dis 10 %

Carpet Stretchers.
Cast Steel, Polished.....₱ doz $3.25
Cast Iron, Steel Points.....₱ doz 80¢
Sockets.....₱ doz $1.75
Bullard's.....dis 25 @ 25&10 %

Carpet Sweepers.
Bissell No. 5.....₱ doz $17.00
Bissell No. 7 New Drop Pan.....₱ doz $19.00
Bissell No. 12 Hall Sweeper.....₱ doz $36 00
Grand Rapids.....₱ doz $27.00
Crown Jewel.....No. 1, $18; No. 2, $19; No. 3, $20
Magic.....₱ doz $15.00
Jewel.....₱ doz $17.00
Mystic.....₱ doz $16.00
Cottage.....₱ doz $15.00
Garland.....₱ doz $18.00
Parlor Queen.....₱ doz $24.00
Housewife's Delight.....₱ doz $15.00
Queen.....₱ doz $16.00
Queen, with band.....₱ doz $18.00
King.....₱ doz $30.00
Weed Improved.....₱ doz $18.00
Hub.....₱ doz $16.00
Cog Wheel.....₱ doz $16.00
Church.....each $3.00

Cartridges.—See Ammunition.

Casters.
Bed, Plate, Shallow Socket, Deep Socket, Yale Casters, list May, 1884.....} New list: Brass...dis 55 % Others...dis 60 % 40&10 %
Yale, Gem.....dis 60@60&5 %
Martin's Patent (Phœnix).....dis 45&10 @ 50 %
Payson's Anti-friction.....dis 60 %
"Giant" Truck Casters.....dis 10 @ 10&5 %
Stationary Truck Casters.....dis 45&10

Cattle Leaders.
Humason, Beckley & Co.'s.....dis 75 @ 75&10 %
Sargent's.....dis 66⅔&10 %
Hotchkiss.....dis 30 %
Peck Stow & W. Co.....dis 50&10 %

Chain.
Trace, 6¼-10-2, exact sizes, ₱ pa'r, $1 03 } dis 50&10&5
Trace, 6¼-10-3, exact sizes, ₱ pair, .92 } @ 50&10&7½ %
Trace .7-10-2, exact sizes, ₱ pair, 1.11 }
NOTE.—Traces. "Regular" sizes 3¢ net ₱ pair less than exact.
Log, Fifth, Stretcher, and other fancy Chains, list Nov. 1, 1884.....dis 50&10 @ 50&10&5 %
American Coil 3-16 ¼ 5-16 ⅜ 7-16 ½ ⅝ ¾
In cask lots. 9 6.40 5.35 4.60 4.40 4.20 3.95 3.75
Less than cask lots, add ½@1½¢ ₱ ℔.
German Coil, list of June 20, 1887.....dis 60@60&5 %
Ger. Halter Chain, list of June 20, 1887...dis 60@60&5 %
Covert Halter, Hitching and Breast.....dis 50&2 %
Covert Traces.....dis 35&2 %
Oneida Halter Chain (old list).....dis 45 %
Galvanized Pump Chain.....₱ ℔ 6¢ @ 6¼¢
Jack Chain, Iron.....dis 70&10 @ 75 %
Jack Chain, Brass.....dis 70&10 @ 75 %

Chalk.
White.....₱ gro 55¢
Red.....₱ gro 75¢
Blue.....₱ gro 90¢
White Crayons.....₱ gro 12¢ @ 12½¢

Chalk Lines.—See Lines.

Chisels.
Socket Framing and Firmer—
Witherby and Douglas, P., S. & W., New Haven and Middlesex, Mix.....} dis 75&10 @ 75, 10&5 %
Buck Bros.....dis 30 %
Merrill.....dis 60&10@60&10&5 %
L. & I. J. White.....dis 30 @ 30&5 %
Tanged Firmers.....dis 40&10 @ 50 %
Tanged Firmers, Butcher's.....$4.75 @ $5.00
Tanged Firmers, Spear & Jackson's.....$5.00 to £
Tanged Firmers, Buck Bros.....dis 30 %
Cold Chisels, ₱ ℔.....16¢ @ 19¢

Chucks.
Beach Patent.....each, $8.00, dis 20 %
Morse's Adjustable.....each, $7.00, dis 20 @ 20&5 %
Danbury.....each, $6.00, dis 30 @ 30&5 %
Syracuse, Balz Pat.....dis 25 %

Clamps.
Providence Tool Co.'s Wrought Iron.....dis 25 %
Adjustable, Gray's.....dis 20 %
Adjustable, Lambert's.....dis 20 %
Adjustable, Snow's.....dis 40&5 %
Adjustable, Hammer's.....dis 15 %
Adjustable, Stearns'.....dis 20&10 %
Stearns' Adjustable Cabinet and Corner...dis 20&10 %
Cabinet, Sargent's.....dis 66⅔&10 %
Carriage Makers', Sargent's.....dis 66⅔&10 %
Eberhard Mfg. Co.....dis 40&5 @ 40&10 %
Warner's.....dis 40&10 @ 40&10&5 %
Saw Clamps.....See Vises

Clips.
Norway, Axle, ¼ & 5-16.....dis 55&5&5
Second grade Norway Axle, ¼ & 5-16.....dis 65&5
Superior Axle Clips.....dis 66⅔&5 @ 66⅔&5&5 %
Norway Spring Bar Clips, 5-16.....dis 60&5&5
Wrought-Iron Felloe Clips.....₱ ℔ 5½¢
Steel Felloe Clips.....₱ ℔ 5¢

Cockeyes......dis 50 %

Cocks, Brass.
Hardware list.....dis 40&10&2 %

Coffee Mills.
Box and Side, List revised Jan. 1, 1888.dis 50@50&10 %
Selsor's Patent.....$6.50, $10.50, dis 25 %
American, Enterprise Mfg. Co.....dis 20&10@30 %
The "Swift," Lane Bros.....dis 20&10 %
Webb's Patent.....dis 45 %

Compasses, Dividers, &c.
Compasses, Calipers, Dividers.....dis 70@70&10 %
Bemis & Call Co.'s Dividers.....dis 60&5 %
Bemis & Call Co.'s Compasses & Calipers....dis 50&5 %
Bemis & Call Co.'s Wing & Inside or Outside.dis 50&5 %
Bemis & Call Co.'s Double.....dis 60 %
Bemis & Call Co.'s (Call's Patent Inside).....dis 30 %
Excelsior.....dis 50 %
J. Stevens & Co.'s Calipers and Dividers....dis 25&10 %

Coopers' Tools.
Bradley's.....dis 20 %
Barton's.....dis 20@20&5 %
L. & I. J. White.....dis 20&5 %
Albertson Mfg. Co.....dis 25 %
Beatty's.....dis 40 @ 40&5 %
Sandusky Tool Co.....dis 30 @ 30&5 %

Corkscrews.
Humason & Beckley Mfg. Co. .....dis 40 @ 40&10 %
Clough's Patent.....dis 33⅓ @ 33⅓&5 %
Howe Bros. & Hulbert.....dis 35 %

Corn Knives and Cutters.
Bradley's.....dis 10 %
Wadsworth's.....dis 25 %

Cradles.—Grain.....dis 50&10 @ 60 %

Crow Bars.
Cast Steel.....₱ ℔ 4¢
Iron, Steel Points.....₱ ℔ 3½¢

Curry Combs.
Fitch's.....dis 50&10 @ 50&10&10 %
Rubber.....₱ doz $10.00, dis 20 %
Perfect.....dis 50 %

Curtain Pins.
Silvered Glass.....net
White Enamel.....net

Cutlery.
Beaver Falls and Booth's.....dis 33⅓ %
Wostenholme.....$7.75 to £

Dampers, &c.
Dampers and Clips, Buffalo.....dis 40 %
Crown Damper.....dis 40 %
Excelsior.....dis 40&10 %

Dividers—See Compasses.

Dog Collars.
Embossed Gilt, Pope & Stevens' list.....dis 30&10 %
Leather, Pope & Stevens' list.....dis 40 %
Brass, Pope & Stevens' list.....dis 40 %

Door Springs.
Torrey's Rod, regular size.....₱ doz $1.30
Gray's.....₱ gro, $20.00, dis 20 %
Bee Rod.....₱ gro, $20.00, dis 20 %
Warner's No. 1, ₱ doz, $2.50; No. 2, $3.30, dis 40&10&50 %
Gem (Coil), list April 19, 1886.....dis 10 %
Star (Coil), list April 19, 1886.....dis 20 %
Victor (Coil).....dis 60 @ 60&10 %
Champion (Coil).....dis 60&10 @ 60&10&10 %
Philadelphia.....5 in., $5.00; 8 in., $7.75, dis 30 %
Cowell's.....No. 1, ₱ doz $18.00; No. 2, $15.00, dis 50 %
Rubber, complete.....₱ doz $4.50, dis 55&10 %
Hercules.....dis 50 %
Shaw Door Check and Spring.....dis 25 @ 30 @ 35 %
Elliott's Door Check and Spring.....dis 25 %

Drawing Knives.
Witherby and Douglas, P., S. & W., New Haven and Middlesex.....} dis 75&10 @ 75, 10&5 %
Merrill.....dis 60&10&10 %
Watrous.....dis 15&10 @ 25 %
L. & I. J. White.....dis 20&5 %
Bradley's.....dis 35 %
Adjustable Handle.....dis 20 @ 25 %
Wilkinson's Folding.....dis 25 @ 25&5 %

Drills and Drill Stocks.
Blacksmiths'.....each, $1.60 @ $1.65
Blacksmiths' Self-Feeding.....each, $7.50, dis 20 %
Breast, P. S. & W.....dis 40&10 %
Breast, Wilson's.....dis 30&5 %
Breast, Millers Falls.....each, $3.00 dis 25 %
Breast, Bartholomew's... each, $2.50, dis 25&10 @ 40 %
Ratchet, Merrill's.....dis 20 @ 20 & 5 %
Ratchet, Ingersoll's.....dis 25 %
Ratchet, Parker's.....dis 20 @ 20&5 %
Ratchet, Whitney's.....dis 20&10 %
Ratchet, Weston's.....dis 30@25 %
Ratchet, Moore's Tripie Action.....dis 25 & 30 %
Whitney's Hand Drill, Plain, $11.00; Adjustable, $12.00.....dis 20&10 %
Wilson's Drill Stocks.....dis 1' %
Automatic Boring Tools.....each, $1.75 @ $1.85
Twist Drills—
Morse.....dis 50&10&5 %
Standard.....dis 50&10&5 %
Syracuse.....dis 50&10&5 %
Cleveland.....dis 50&10&5 %
Williams.....dis 50&10&10 %
Drill Bits.—See Augers and Bits.
Drill Chucks.—See Chucks.

Dripping Pans.
Small sizes.....₱ ℔ 7 ¢
Large sizes.....₱ ℔ 6½ ¢

Egg Beaters.
Dover.....₱ doz., $2.00
National.....₱ doz $4.50, dis 33⅓ %
Family (T. & S. Mfg. Co.).....₱ gro, $17.00@$18.00
Standard (Standard Co.).....₱ gro, $9.00
Kingston (Standard Co.).....₱ gro, $7.50
Acme (Standard Co.).....₱ gro, $7.00
Duplex (Standard Co.).....₱ gro, No. 1, $20; No. 2, $15
Triumph (T. & S. Mfg. Co.).....₱ gro, f 10.50@$11.50
Advance No. 1.....₱ gro $10.50
Advance, No. 2.....₱ gro $10.00
Bryant's.....₱ gro $15.00
Ayres' Spiral.....₱ gro $5
Paine, Buehl & Co's.....₱ gro $24.00

Electric Bell Sets.—Wollensak's.....dis 15 %
Bigelow & Dowse.....dis 20 %

Emery.	No. 4 to 46 gr.	No. 54 to 150 gr.	Flour, CF FF.
Kegs, ₱ ℔	4 ¢	5 ¢	2¼¢
½ kegs, ₱ ℔	4¼¢	5½¢	2¾¢
¼ kegs, ₱ ℔	4½¢	5½¢	3 ¢
10-℔ cans, 10 in case	6 ¢	6½¢	5 ¢
10-℔ cans, less than 10	10 ¢	10 ¢	7½¢

Enameled and Tinned Ware.—See Hollow-Ware.

Escutcheon Pins.
Iron, list Nov. 11, 1885.....dis 50&10 @ 50&10&5
Brass.....dis 60 @ 60&5 %

Escutcheons.
Door Lock.....Same discounts as Door Locks
Brass Thread.....dis 60 @ 60&10 %
Wood.....dis 25 %

Faucets.
Fenn's.....dis 40 %
Bohren's Patent Rubber Ball.....dis 25 %
Fenn's Cork Stops.....dis 33⅓ %
Star.....dis 60 @ 60&5 %
Frary's Patent Petroleum.....dis 40&10&2 %
West's Patent Key.....dis 50&10 %
Anchor Cock.....dis 45 %
Metallic Key, Leather Lined.....dis 55&10 @ 60&10 %
Cork Lined.....dis 70 @ 70&10 %
Burnside's Red Cedar.....dis 50 %
Burnside's Red Cedar, bbl. lots.....dis 50&10 %
J. Sommer's Best Block Tin Key.....dis 40 %
J. Sommer's Cork Lined, 1st quality.....dis 50 %
J. Sommer's Diamond Lock.....dis 40 %
J. Sommer's Perfection, Fla. Red Cedar.....dis 50 %
J. Sommer's Goodenough Cedar.....dis 60 %
Self-Measuring, Enterprise...₱ doz $36.00—dis 20&10 %
Self-Measuring, Lane's.....₱ doz $36.00—dis 25&10 %
Self-Measuring, Victor.....₱ doz $36.00—dis 25&10 %

Felloe Plates.....₱ ℔ 6 @ 6½¢

Fifth Wheels.—Derby and Cincinnati .dis 45&5 %

Files.
Domestic—
Best brands.....dis 60&10 @ 60&10&5 %
Good brands.....dis 60&10&5 @ 60&10&10 %
Fair brands.....dis 70 @ 70&10 %
Heller's Horse Rasps.....dis 50&7½ @ 50&10 %
Imported—
J. & Riley Carr.....List, April 1, 1883, dis 15 %
J. & Riley Carr Horse Rasps.....dis 10 %
Moss & Gamble.....List April 1, 1883, dis 15 %
Butcher.....Butcher's list, dis 20 %
Stubs.....Stubs list, dis 25 @ 30 %
Turton's.....Turton sellat dis. 20 @ 25 %
Greaves' Horse Rasps.....American list, dis. 60 %

Fluting Machines.
Knox, 4¼-inch Rolls.....$3.25 each } dis 35 %
Knox, 6-inch Rolls.....$3.60 each }
Eagle, 3¼-inch Roll.....$2.15, dis 35 %
Eagle, 5¼-inch Roll.....3.85, dis 35 %
Crown, 4¼ in., $3.50: 6-in, $4.00; 8-in., $6.50 each, dis 35 %
Crown Jewel.....6-in., $2.50 each, dis 35 %
American, 5-in., $3; 6-in., $3.40; 7-in., $4.50 each, dis 35 %
Domestic Fluter.....$1.50 each, net
Geneva Hand Fluter, White Metal..₱ doz $12, dis 25 %
Crown Hand Fluter, Nos. 1, $15; 2, $12.50; 3, $10, dis 30 %
Shepard Hand Fluter, No. 85.....₱ doz $15.30, dis 40 %
Shepard Hand Fluter, No. 110.....₱ doz $11, dis 40 %
hepard Hand Fluter, No. 95.....₱ doz $8, dis 40 %
Clark's Hand Fluter.....₱ doz $15.00, dis 35 %
Combined Fluter and Sad Iron...₱ doz $15.00, dis 30 %
Buffalo.....₱ doz $10.00. dis 10 %

Fluting Scissors.....dis 45 %

Forks.—Hay, Manure, &c., Asso. list.....dis 65&5 %
Hay, Manure, &c., Phila. list.....dis 60 @ 60&5 %
Plated, see Spoons.

Freezers, Ice Cream.
Lightning.....dis 65 %

Fruit and Jelly Presses.
Enterprise Mfg. Co.....dis 20&10 @ 30 %
Henis.....₱ doz $4.50
Queen City.....dis 40 %

Fry Pans.
Association List.....dis 75 @ 75&10 %

No.	0	1	2	3	4	5	6	7	8
₱ doz.	$3.75	4.70	5.30	5.95	6.55	7.50	8.75	10.00	11.25

Fuse......₱ 1000 ft.
Common Hemp Fuse, for dry ground.....$2.70
Common Cotton Fuse, for dry ground.....2.85
Single Taped Fuse, for wet ground.....4.75
Double Taped Fuse, for very wet ground.....6.00
Triple Taped Fuse, for very wet ground.....7.25
Small Gutta Percha Fuse, for water.....7.50
Large Gutta Percha Fuse, for water.....12.00

Gauges.
Marking Mortise, &c .....dis 60&10 %
Wire, low list.....dis 10&10 %
Wire, Wheeler, Madden & Co.....dis 10 %
Wire, Morse's.....dis 50 @ 50&5 %
Wire, Brown & Sharpe's.....dis 10 @ 20 %

Gimlets.—Nail and Spike.....dis 50&10&5 %
"Eureka" Gimlets.....dis 40&10 %
"Diamond" Gimlets.....₱ gross $5.00
Double Cut, Shepardson's.....dis 45 @ 45&5 %
Double Cut, Ives'.....dis 60 @ 60&5 %
Double Cut, Douglass'.....dis 40&10 %
"Bee".....₱ gross $12, dis 25 @ 25&5 %

Glue Pots.
Tinned and Enameled.....dis 40&5 @ 40&10%
Family, Howe's "Eureka".....dis 40 %
Family, L. F. & C.'s "Handy".....dis 50 %

Grindstone Fixtures.
Sargent's Patent.....dis 70&10 %
Reading Hardware Co.....dis 30&10 %

Hack Saws.—See Saws.

Halters.—Covert's Pat. ¼ Jute.....dis 50&2 %
Covert's Hemp Horse and Cattle Tie.....dis 50&2 %
Covert's Jute Horse and Cattle Ties.....dis 60&10&2 %

Hammers.
Handled Hammers.
Maydole's.....List Dec. 1, 1885, dis 25 @ 25&1 0%
Buffalo Hammer Co.....
C. Hammond & Son.....
Humason & Beckley.....
Atha Tool Co.....
Verree.....} List Jan. 15, '87 Dis. 50 @ 50& 10 %
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.dis 30&10 %
Nelson Tool Works.....dis 40&10 %
Warner & Nobles.....dis 20 @ 25 %
Peck, Stow & Wilcox.....dis 40 %
Sargent's.....dis 33⅓&10 %
Heavy Hammers and Sledges—
3 ℔ and under.....₱ ℔ 40¢ } dis 70 @ 70 &5 %
3 to 5 ℔.....₱ ℔ 36¢ }
Over 5 ℔.....₱ ℔ 30¢ }
Wilkinson's Smiths'.....10½¢ @ 11¢ ₱ ℔

Hand Cuffs and Leg Irons.
Providence Tool Co., Hand Cuffs, $15.00 ₱ doz..dis 10%
Providence Tool Co. ,Leg Irons, $25.00 ₱ dos....dis 10 %
Tower's.....dis 25 %
Daley's Improved Hand Cuffs: 2 Hands, Polished, ₱ doz, $48; Nickeled, $57; 3 Hands, Polished, ₱ doz, $72; Nickeled, $84.....dis 20 %

Handles.
Iron, Wrought or Cast.—
Door or Thumb.

Nos.	0	1	2	3	4
Per doz.	$0.90	1.00	1.18	1.35	1.50

....dis 60&10&10 %
Roggin's Latches.....₱ doz. 30¢ @ 35¢
Bronze Iron Drop Latches.....₱ doz. 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88.....net
Barn Door.....₱ doz. $1.40, dis 10&10 %
Chest and Lifting.....dis 70 %

Handles, Wood—
Saw and Plane.....dis 40&10 @ 40&10&5 %
Hammer, Hatchet, Axe, Sledge, &c.....dis 35 %
Brad Awl.....₱ gross $2.00
Hickory Firmer Chisel, assorted.....₱ gross 4.50 } dis 40 %
Hickory Firmer Chisel, large.....₱ gross 5.00
Apple Firmer Chisel, assorted.....₱ gross 5.00
Apple Firmer Chisel, large.....₱ gross 6.00
Socket Firmer Chisel, assorted.....₱ gross 3.00
Socket Framing Chisel, assorted.....₱ gross 5.00
J. B. Smith Co.'s Pat. File.....dis 50 %
File, assorted.....₱ gross 3.75 } dis 40 @ 40&10 %
Auger, assorted.....₱ gross 5.00
Auger, large.....₱ gross 7.00
Patent Auger, Ives'.....dis 30&10 %
Patent Auger, Douglass'.....₱ set $1.25 net
Patent Auger, Swan's.....₱ set $1.00 net
Hoe, Rake, Shovel, &c.....dis 50&10 %
Cross Cut Saw Handles—
Atkins' No. 1 Loop, ₱ pair, 30¢ No. 3, 22¢; No. 2 and No. 4 Reversible, 22¢.
Boynton's Loop Saw Handles.....50¢, dis 60 %
Champion.....15¢

Hangers.
Barn Door, old patterns.....dis 60&10&10 @ 70 %
Barn Door, New England.....dis 60&10&10 @ 70 %
Samson Steel Anti-Friction.....dis 55 %
Orleans Steel.....dis 55 %
Hamilton Wrought Wood Track.....dis 55 %
U. S. Wood Track.....dis 65 %
Champion.....dis 60&10 %
Rider and Wooster, Medina Mfg. Co.'s list.....dis 70 %
Climax Anti-Friction.....dis 55 %
Climax Steel Anti-Friction.....dis 50 %
Zenith for Wood Track.....dis 55 %
Reed's Steel Arm.....dis 40 %
Challenge, Barn Door.....dis 50 %
Sterling Improved (Anti-Friction).....dis 65&10 %
Victor, No. 1, $15; No. 2, $16.50; No. 3, $18...dis 50&2 %
Cheritree.....dis 50&5 %
Kidder's.....dis 50&10 @ 60 %
The "Boss".....dis 60 %

Best Anti-Friction.....dis 60 %
Duplex (Wood Track).....dis 60 %
Terry's Patent.....₩ dos. pr., 3¼ in. $10; 5 in., $12.....dis 50 @ 50&5 %
Cronk's Patent....No. 4, $12; No. 5, $14.40; No. 6, $18 %.....dis 50&10 @ 50&15 %
Wood Track, Iron Clad..₩ ft. 10¢, dis 50&10 @ 50&15 %
Architect.....₩ set $6.00, dis 20 %
Eclipse.....dis 20&10
Felix.....₩ set $4.50, dis 20 %
Richards'.....dis30@30&10 %
Lane's Steel Anti-Friction.....dis 40&10 %
The Ball Bearing Door Hanger....dis 20&10 @ 25&10 %
Warner's Patent.....dis 20@20&10 %
Stearns' Anti-Friction.....dis 20 @ 20&10 %
Stearns' Challenge.....dis 25&10 @ 25&10&10 %
Faultless.....dis 40 @ 40&5 %
American.....₩ set $6; dis 20&10 %
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢.....dis 40 %
Paragon, Nos. 1, 2 and 3.....dis 40&10 %
Paragon, Nos. 5, 5½, 7 and 8.....dis 20&10 %
Crescent.....dis 60@60&10 %
Nickel, Cast Iron.....dis 50 %
Nickel, Malleable Iron and Steel.....dis 40 %

Harness Snaps.—See Snaps.

Hatchets.—List Jan. 1, 1886.

Isaiah Blood.....dis 35 @ 40%
Hunt's Shingling Lath and Claw.....dis 40&5 %
Hunt's Broad.....dis 40 %
Buffalo Hammer Co.....dis 40&10@50 %
Hurd's.....dis 40&5 @ 40&10&5 %
Yerkes & Plumb.....40&5 @ 40&10 %
Wm. Mann, Jr., & Co.....dis 50 @ 50&5%
Underhill Edge Tool Co.....dis 40&5 @ 40&10 %
Underhill's Haines and Bright goods.....dis 33⅓ %
C. Hammond & Son.....dis 40&10 @ 50 %
Simmons.....dis 35 @ 40 %
Peck's.....dis 40&10 @ 40&10&5 %
Kelly's.....dis 50@50&5 %
Sargent & Co.....dis 50 %
Ten Eyck Edge Tool Co.....dis 40&10@40&10&5 %
Collins, following list.....dis 10 %

Shingling,	Nos. 1 2 2.....	₩ doz	$5.50	$6.00 $6.50
Claw,	Nos. 1 2 3.....	₩ doz	6.00	6.50 7.00
Lathing	Nos. 1 2 3.....	₩ doz	5.50	6.00 6.50

Hay Knives.

Lightning.....Mfrs. price ₩ doz $18 dis 25 %; Jobber's Extras
Electric.....₩ doz $17 ; dis 30 @
Gem.....₩ doz $18 ; 30&5%
Wadsworth's.....dis 40&7½ @ 40&10 %
Carter's Needle.....₩ doz $11.50 @ $12.00
Heath's.....₩ doz $13.50 @ $14.00

Hinges.

Wrought Iron Hinges—
Strap and T.....dis70&5 @ 70&10 %
Screw Hook and Strap. { 8, 10, 12 in., ₩ ℔..... 3½¢ ; 14 to 36 in. ₩ ℔.....
Heavy Welded Hook { 8 to 12 in., ₩ ℔..... 3½¢ ; 14 in. & up, ₩ ℔..... 3½¢
Screw Hook and Eye. { ⅜ in.....₩ doz $1.50 ; ⅝ in.....₩ doz $2.45 ; ¾ in.....₩ doz $3.80 } dis 10%
Rolled Blind Hinges, Nos 32 and 34.....dis 50&10 %
Rolled Blind Hinges, Nos. 232 and 234....dis 55&10 %
Rolled Plate.....dis 70&10 %
Rolled Raised.....dis 70&10 %
Plate Hinges { 8, 10 & 12 in., ₩ ℔..... 4½¢ ; "Providence" over 12 in., ₩ ℔..... 3¾¢

Spring Hinges—
Geer's Spring and Blank Butts.....dis 40 %
Union Spring Hinge Co.'s list, March, 1886...dis 20 %
Acme, Crown, Empire and U. S .....dis 30 %
American, Gem, and Star, Japanned.....dis 20 %
American, Gem, and Star, Bronzed.....net
Oxford, Bronze and Brass.....net
Barker's Double Acting.....dis 20&10 %
Union Mfg. Co.....dis 25 %
Bommer's.....dis 30 %
Buckman's.....dis 15@20 %
Chicago.....dis 30 %

Gate Hinges—
Western.....₩ doz $4.40, dis 55 %
N. E.....₩ doz $7.00, dis 55 %
N. E. Reversible.....₩ doz $5.20, dis 55&10 %
Clark's, Nos. 1 2 3.....dis 60&10 @ 60&10&5 %
N. Y. State.....₩ doz $5.00, dis 55&10 %
Automatic.....₩ doz $12.50, dis 50 %
Common Sense.....₩ doz pair $4.50, dis 50 %
Seymour's.....dis 45&10 %
Shepard's, Nos. 1, 2, 10 and 20.dis 60&10@60&10&10 %
Shepard's, No. 3.....dis 60&10@60&10&10 %
Reed's Latch and Hinges.....₩ doz sets $12, dis 50 %

Blind Hinges—
Parker.....dis 75&2 %
Palmer.....dis 50&5&10 %
Seymour.....dis 70&2 %
Nicholson.....dis 45&10 %
Huffer.....dis 50 %
Clark's, Nos. 1, 3, 5, 40 and 50.....dis 75&10&5@80 %
Clark's Mortise Gravity.....dis 50 %
Sargent's, Nos. 1, 3, 5, 11, 13...dis 75&10@75&10&5 %
Sargent's, No. 12.....dis 75&10&10 %
Reading's Gravity.....dis 75&10 @ 75&10&5 %
Shepard's "Noiseless." Nos. 50, 60, 65 & 55.....dis 75&10&5 %
Shepard's Niagara Gravity, Nos. 1, 3 and 5...dis 80 %
Shepard's Buffalo Gravity. Nos. 1, 3 and 5.....dis 80&2½ %
Shepard's Champion Gravity No. 75.....dis 80&10&5 %
Shepard's Steamboat Gravity, No. 10.....dis 80&20 %
Shepard's Acme Lull & Porter.....dis 75&5@75&10 %
Shepard's O. S. Lull & Porter.....dis 75&10 %
Shepard's "Queen City" Reversible.....dis 70&10 %
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....dis 75&10&2½ %
North's Automatic Blind Fixtures, No. 2, for Wood, $10.50; No. 3, for Brick, $13.50....dis 25&2 %

Hoes.

Handled—
Garden, Mortar, &c.....dis 65&5 %
Planter's, Cotton, &c.....dis 65&5 %
Warren Hoe.....dis 60 %
Magic.....₩ dos $4.71

Eye—
D. & H. Scovil.....dis 15 %
Lane's Crescent Scovil Pattern.....dis 45 %
Lane's Crescent Planters Pattern.....dis 45 & 5 %
Lane's Razor Blade, Scovil Pattern.....dis 30 %
Maynard, S. & O. Pat.....dis 45&5 %
Sandusky Tool Co., " " .....dis 60 %
Hubbard & Co., " " .....dis 60 %
Barc " " .....dis 60 %
Grub.....dis 60 @ 60&10 %

Hog Rings and Ringers.

Hill's Improved Ringers.....₩ doz. $5.50 @ 5.75
Hill's Old Style Ringers.....₩ doz. $3.00 @ 3.25
Hill's Tongs.....₩ doz. $5.50 @ 6.00
Hill's Rings.....₩ doz boxes, $2.00 @ 2.25
Perfect Rings.....₩ doz boxes $1.75 @ 2.00
Perfect Ringers.....₩ doz. $2.50
Blair's Hog Ringers.....₩ doz. $2.60
Blair's Hog Rings.....₩ doz, 95¢ @ $1.00
Champion Ringers.....₩ doz $2.00
Champion Rings, Double.....₩ doz, $2.25
Brown's Ringers.....₩ doz, $2.00
Brown's Rings.....₩ doz, $1.25 @ 1.30

Hoisting Apparatus.

"Moore's" Hand Hoist, with Lock Brake.....dis 15 %
"Moore's" Differential Pulley Block.....dis 20 %

Holders, Tool.

Balz Pat.....₩ doz $4 ; dis 25 %

Hollow-Ware.

Iron—
Stove Hollow-Ware, Ground..dis 60&10@60&10&10 %
Stove Hollow-Ware, Unground dis 70&10@70&10&5 %
Enameled and Tinned Hollow-Ware—
Kettles.....dis 70&10 %
Oval Boilers, Saucepans & Glue Pots.....dis 40&10 @ 60 %
Gray Enameled Ware.....dis 10 @ 40&5 %
Agate and Granite Ware.....dis 25 %
Rustless Hollow-Ware.....dis 50 @ 50&5 %
Galvanized Tea-Kettles—

Inch.....	6	7	8	9
Each.....	55¢	60¢	65¢	75¢

Silver Plated—
Reed & Barton.....dis 40&5 %
Meriden Brittania Co.....dis 40&5 %
Simpson, Hall, Miller & Co.....dis 40&5 %
Rogers & Brother.....dis 40&5 %
Hartford Silver Plate Co.....dis 40&5&5 %
William Rogers Mfg. Co.....dis 40&5&5 %

Hooks.

Cast Iron—
Bird Cage, Sargent's list.....dis 60&10&10 %
Bird Cage, Reading.....dis 60&10&10 %
Clothes Line, Sargent's list.....dis 60&10&10 %
Clothes Line, Reading list, dis 60&10 @ 60&10&10 %
Ceiling, Sargent's list.....dis55&10&10 %
Harness, Reading list.....dis 55&10 @ 55&10&10 %
Coat and Hat, Sargent's list.....dis 55&10 %
Coat and Hat, Reading.....dis 50&10 @ 50&10&10 %

Wrought Iron—
Cotton.....₩ dos $1.25
Cotton Pat. (N. Y. Mallet & Handle Wks).....dis 30 %
Tassel and Picture (T. & S. Mfg. Co.).....dis 50 %
Wrought Staples, Hooks, &c.....See Wrought Goods
Bench Hooks.....See Bench Stops

Wire—
Wire Coat and Hat, Gem, list April, 1886.....dis 45 %
Wire Coat and Hat, Miles', list April, 1886.....dis 45 %
Indestructible Coat and Hat.....dis. 45 %
Belt.....dis 75&10 @ 80 %
Grass.....₩ doz $2.00
Bush.....dis 55 @ 60 %
Whittree—Patent.....dis 55 %
Hooks and Eyes—Malleable Iron.....dis 70 %
Hooks and Eyes—Brass.....dis 60&10&10 %
Fish Hooks, American.....dis 50 %

Horse Nails.

	Nos.	6	7	8	9	10	
Ausable		28¢	26¢	25¢	24¢	23¢	dis 25&10@25&10&10 %
Clinton, Fin		24¢	22¢	21¢	20¢	19¢	dis 40&10 @ 50 %
Essex		28¢	26¢	25¢	24¢	23¢	dis 25&10 @ 25&10&10 %
Putnam		24¢	22¢	21¢	20¢	19¢	dis 5&10&2½&2½ %
Vulcan		23¢	21¢	20¢	19¢	18¢	dis 12½&5 %
Northwest'n		25¢	23¢	22¢	21¢	20¢	dis 20&10 %
Globe		23¢	21¢	20¢	19¢	18¢	dis 12½&5&5 %
A. C		25¢	23¢	22¢	21¢	20¢	dis 25&10 @ 25&10&5 %
C. B.-K		25¢	23¢	22¢	21¢	20¢	dis 25&10 @ 25&10&5 %
Champlain		28¢	26¢	25¢	24¢	23¢	dis25&10&10&5 %
New Haven		28¢	26¢	25¢	24¢	23¢	dis25&10@25&10&10 %
Saranac		23¢	21¢	20¢	19¢	18¢	dis 30&10 %
Champion		25¢	23¢	22¢	21¢	20¢	dis 10&10&10 %
Capewell		28¢	26¢	25¢	24¢	23¢	dis 35&5 @ 35&10 %
Star		23¢	21¢	20¢	19¢	18¢	dis 10&10@10&12½ %

Horse Shoes.—See Shoes, Horse.

Hose, Rubber, competition.....75&10 @ 80 %
Standard.....dis 70@70&10 %
Extra.....dis 60@10&10 %
N. Y. B. & P. Co., Para.....dis 30&10 %
N. Y. B. & P. Co., Extra.....dis 50&5 %
N. Y. B. & P. Co., Dundee.....dis 60&10&10 %

Ice Picks, Chisels, &c.
Am. Ice Chisel Pol'd.....₩ dos $3.00, dis 2[illegible]@20&5 %
National Ice Chisel.....₩ doz $6.25, dis 20 %
Novelty Ice Breakers.....₩ doz $6.25, dis 20 %
Dunlap's Ring Picks.....₩ doz $2.00, dis 15 %
Wood Head Picks, Sargent's.....₩ doz $1.60, dis 50&10 %
Iron Head Picks, Sargent's.....₩ doz $1.25, dis 50&10 %
Ice Mallets, Pick in handle.....₩ doz $2.00, dis 15 %
Ice Axes, Small Cast or Mall...₩ doz $1.25, dis 20&10 %
Combination Ice Tools.....₩ doz $2.00 net
Acme Ice Pick and Tongs...₩ gross $55.00, dis 50&10 %
Roger's Lightning Ice Chisel.....₩ gross $28.50

Ice Tongs.

Champion, S. S. & Co.....₩ doz $4.00, dis 25&10 %
Family.....₩ doz $2.75, dis 20@25 %

Jack Screws.—See Screws.

Kettles.

	Spun.	Stamped.
Brass, 7 to 17 in., ₩ ℔.....	24¢	22¢
Brass larger than 17 inches, ₩ ℔..	26¢	24¢
Enameled and Tea Kettles.....	See *Hollow Ware*	

Keys.

Lock Asso'n list Dec. 30, 1886.....dis 50&10 @ 60&5 %
Eagle, Cabinet, Trunk and Padlock.....dis 33⅓&2 %
Hotchkiss' Brass Blanks.....dis 40 %
Hotchkiss' Copper and Tinned.....dis 40 %
Hotchkiss' Padlock and Cabinet.....dis 35 %
Ratchet Bed Keys.....₩ doz $4.00, dis 15 %

Knife Sharpeners.

Parkin's Applewood Handles.....₩ doz $6.00, dis 40 %
Parkin's Rosewood or Cocobolo...₩ doz $9.00, dis 40 %

Knives.

Wilson's Butcher Knives.....dis 20 @ 25 %
Ames' Butcher Knives.....dis 25 %
Nichols' Butcher Knives.....dis 40&10
Ames' Shoe Knives.....dis 20@25 %
Ames' Bread Knives.....₩ dos $1.50, dis 15 @ 20 %
Moran's Shoe and Bread Knives.....dis 20 %
Hay and Straw.....See Hay Knives
Table and Pocket.....See Cutlery

Knobs.

Door Mineral.....65@70¢
Door Por. Jap'd.....75@80¢
Door Por. Por. Nickel.....$2.00 @ 2.25
Door Por. Plated, Nickel.....$2.00 @ 2.25
Drawer, Porcelain.....dis 55&10&10@6. &10&10 %
Hemacite Door Knobs, new list.....dis 40&10@50 %
Yale & Towne Wood Knobs, list Dec., 1885....dis 40 %
Furniture Plain.....75¢ gross inch, dis 10 %
Furniture, Wood Screws.....dis 25&10 %
Base, Rubber Tip.....dis 70&10&5 %
Picture, Judd's.....dis 60&10&10 @ 70 %
Picture, Sargent's.....dis 66⅔&10 %
Picture, Hemacite.....dis 35&5 %
Shutter, Porcelain.....dis 65&10 %
Carriage, Japanned.....₩ gross 80¢, dis 60&10 %

Ladles.
Melting, Sargent's.....dis 55&10
Melting, Reading.....dis 35&10%
Melting, Monroe's Patent.....₩ doz. $4.00, dis 40%
Melting, P. S. & W.....dis 35&10 @ 40%
Melting, Warner's.....dis 30%

Lanterns.

Tubular, No. 9, without Guards.....₩ doz $5.75
Tubular, Liftwire, No.0, without Guards ₩ doz $8.50
Tubular, Hinge Tip No. 0. without Guards, ₩ doz $6.25
Tubular, Bottom Lift, without Guards ..₩ doz $6.25
Tubular, U. S. Safety Lift Wire, no Guards. ₩ doz $5.00
Guards for Tubulars, add ₩ dos.....
Police, Small, $6.00; Med. $7.25; Large, $9.75. dis 20@25 %
Porter's Tin R. R.....$10 dis20 %

Lemon Squeezers.

Porcelain Lined, No. 1.....₩ doz. $6.00, dis 25&30 %
Wood, No. 2.....₩ doz. $3.00, dis 35 %
Wood, Common.....₩ doz $1.70 @ 1.75
Dunlap's Improved.....₩ doz. $3.75, dis 20 %
Sammis'.....No. 1, $5 ; 2, $9 ; 12, $18 ₩ dos. ,dis 25&10 %
Jennings' "Star".....₩ doz $2.50
The "Boss".....₩ doz $2.50
Dean's.....Nos. 1, ₩ doz $6.50; 2, $3.35; 3, $1.90
Little Giant.....dis 50 @ 50&5 %
King.....dis 40&5 %

Lines.

Cotton and Linen Fish, Draper's.....dis 50 %
Draper's Chalk.....dis 60 %
Draper's Mason's Linen, 84 ft., No. 1, $1.25 ; No. 2, $1.75 ; No. 3, $2.25 ; No. 4, $2.75 ; No. 5, $3.25...dis 25 %
Cotton Chalk.....dis 55 %
Samson, Cotton, No. 4, $2; No. 4½, $2.50.....dis 10 %
Silver Lake, Braided, Nos. 0, $6.00 ; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₩ gross.....dis 25 %
Masons' Linen, No. 3½, $1.50 ; No. 4, $2 ; No. 4½, $2.50
Masons' Colored Cotton.....dis 45
Wire Clothes, No. 18, $3.75 ; No 19, $3.25 ; No. 20, $2.75.
Ventilator Cord, Samson Braided, White or Drab Cotton.....$7.50 ₩ doz. dis 20

Locks, Padlocks, Cabinet Locks, &c.

Door Locks, Latches, &c.—
List, Dec. 30, '86, chgd Feb. 2, '87...dis 50&10 @ 60&5 %
Note.—Lower net prices often made.
Reading Hardware Co. (list Jan. 1, '80).dis 40@40&10 %
Livingston & Co.....dis 70 %
Perkins' Burglar Proof.....dis 60&25 %
Plate.....dis 33⅓&2 %
F. Many's "Extension Cylinder".....$10.50 ₩ doz
Barnes Mfg. Co.....dis 40 %
Yale Corrugated Key.....dis 33⅓ %
Dietz Flat Key.....dis 30 %
L. & C. Round Key Latches.....dis 30&10 %
L. & C. Flat Key Latches.....dis 33⅓&10 %
Romer's Night Latches.....dis 20 %
Yale new list.....dis 33⅓ %
"Shepardson" or "U. S.".....dis 35 %
'Felter" or ' American".....dis 40&10 %
Seed's N. Y. Hasp Lock.....dis 25 %

Cabinet—
Eagle, Gaylord Parker and Corbin, } List March, '84, revised Jan. 1, '85.dis33⅓&2 %
Deitz, Nos. 36 to 39.....dis 40 %
Deitz, Nos. 51 to 63.....dis 40 &10 %
Dietz, Nos. 86 to 96.....dis 30 %
Stoddard Lock Co.....dis 30 @ 33⅓ %
'Champion" Night Latches.....dis 40 %
Barnes Mfg. Co.....dis 40 %
Eagle and Corbin Trunk.....dis 25&2 %
Champion" Cabinet and Combination....dis 33⅓ %
Yale.....dis 33⅓ %
Romer's.....dis 25 %

Padlocks—
List, Dec. 23, 84.....dis 65&10&2&—'4
Yale Lock Mfg. Co. s.....dis 33⅓ %
Eagle.....dis 25&2 %
Eureka, Eagle Lock Co.....dis 40&2 %
Romer's, Nos. 1 to 91.....dis 35 %
Romer's, Nos. 200 to 505.....dis 20 %
A. E. Dietz.....dis 40 %
" Champion " Padlocks.....dis 40 %
Hotchkiss.....dis 30 %
'Star".....dis 45 %
"Horse Shoe." ₩ doz.. $9.....dis 40 %
Barnes Mfg. Co.....dis 40 %
Nock's.....dis 30 %
Brown's Patent.....dis 25 %
Scandinavian.....dis60 %
Fraim's Pat. Scandinavian, new list (low)....dis 60 %

Lumber Tools.

Ring Peavies, "Blue Line" Finish.....₩ doz $20.00
Ring Peaves, Common Finish.....₩ doz $18.00
Steel Socket Peavies.....₩ doz $21.00
Mall. Iron Socket Peavies.....₩ doz $19.00
Cant Hooks, "Blue Line" Finish.....₩ doz $16.00
Cant Hooks, Common Finish.....₩ doz $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish.....₩ doz $16.00
Cant Hooks, Mall. Socket Clasp Common Finish.....₩ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Fin. ₩ doz $14.00
Cant Hooks, Clip Clasp, Common Finish. ₩ doz $12.00
Hand Spikes.....₩ doz 6 ft., $15.00 ; 8 ft., $20
Pike Poles, Pike & Hook, 12 ft. 14 ft. 16 ft. 18 ft. 20 ft. ₩ doz.....$11.50 12.50 14.50 17.50 21.50
Pike Poles, Pike only, ₩ doz.....10.00 11.00 13.00 16.00 20.00
Pike Poles, not Ironed, ₩ doz.....6.00 7.00 9.00 12.00 16.00
Setting Poles, ₩ doz..... 14.00 15.00 17.00 .....
wamo Hooks.....₩ doz $18.00
Leaning Blocks.....₩ doz $22.50
Skidding Tongs.....₩ doz $51.00
Log Binders.....₩ doz $26.00
Bended Boot Calks, 1 to 5 M, dis 25 % ; 5 to 10 M, dis 30 %
Square Steel Boot Calks.....dis 40 %
Chain Rafting Dogs.....₩ 100 $12.50
Ring Rafting Dogs...₩ 100, med., $10.00 ; large, $12.00
Timber Grapples.....₩ dos $30.00

Lustro.
Four-ounce Bottles.....₩ doz. $1.75 ₩ gro. $17. 00

Mallets.
Hickory.....dis 20&10@20&10&10 %
Lignumvitæ.....dis 20&10@20&10&10 %
B. & L. Block Co, Hickory and L. V...dis 30 @ 30&10 %

Mattocks.—Regular list.....dis 60&5 @ 60&10 %

Meat Cutters

Dixon's—Nos.	1	2	3	4	
₩ dos.....	$14.00	17.00	19.00	30.00	—dis 45 %
Woodruff's.....	Nos.	100	150		
	₩ doz.	$15.00	18.00		—dis 45 %
Champion.....	Nos.	200	300	400	
	₩ dos.	$22.00	27.00	40.00	—dis 45 %
Hales' Pattern	Nos. 11	12	13		
₩ doz...	$27.00	33.00	45.00		dis 70 @ 70 & 5 %

American.....dis 30 %

Nos.....	1	2	3	4B		
Each.....	$5.00	7.00	10.00	25.00	50.00	60.00

Enterprise.....dis 30 %

Nos.....	10	12	22	32	42
Each.....	$3 00	2.50	4.00	6.00	15.00

Pennsylvania.....dis 40&10&5

	1	2	3	00
Nos.				
₱ doz.	$24.00	28.00	36.00	28.00

Miles' Challenge..Nos. 1 2
₱ doz..$32.00 30.00 40.00—dis 45@45&10 %

Home No. 1.....$26 ₱ doz, dis 55&10 %
Draw Cut..Nos.. 5 7 6 8
Each....$60.00 75.00 80.00 225.00—dis 20 @ 25 %
Beef Shavers (Enterprise Mfg. Co.)....dis 20&10 @ 30 %
Chadborn's Smoked Beef Cutter.....₱ doz, $60.00

Mincing Knives.
Am. (2d quality), ₱ gro, 1 blade, $7; 2 blades, $12; 3 blades, $18.....net
Lothrop's.....dis 20&10 %
Smith's. ₱ doz, Single, $2.00; Double, $3....dis 40@45 %
Knapp & Cowles.....dis 50&10@60 %

Molasses Gates.—Stebbins' Pat..dis 70@70 & 7½ %
Stebbins' Genuine.....dis 60&10&10 %
Stebbins' Tinned Ends.....dis 40&10 %
Chase's Hard Metal.....dis 50&10 %
Bush's.....dis 20 %
Lincoln's Pattern.....dis 66⅔&10 %
Weed's.....dis 20&10 %

Boss Nos..	1	2	3	4
	$7.00	8.00	9.00	10.00

₱ doz, dis 60&10&10 %

Money Drawers.—₱ doz., $18 @ $20.

Muzzles.—Safety, ₱ doz. $3.....dis 25 %

Nails......See Trade Report
Wire Nails, list July 14, '87.....dis 60&10&10&70 %
Wire Nails, Standard Penny.....₱ keg, $2.75 @ $2.85
Wire Carpet Nails.....See Tacks

Nail Puller.—Curtiss Hammer.....₱ doz $9.00 net
Giant, No. 1.....₱ doz $30.00, dis 10 %
Pelican.....₱ doz $9.00, dis 25 %
Boss.....₱ doz $30, dis 30 %

Nail Sets.—Square.....₱ gro., $4.00 @ $4.25
Round.....₱ gro., $3.25
Cannon's Diamond Point.....₱ gro. $12 dis 30 %

Nut Crackers.
Table (Humason & Beckley Mfg. Co.).....dis 40 %
Blake's Pattern.....₱ doz $2.00, dis 10 %
Turner & Seymour Mfg. Co.....dis 50 %

Nuts and Washers.

Size....	¼	5-16	⅜	½	⅝	¾	1
Washers.....	7	5¾	4½	4	3½	3¼	3¼

Nuts, all kinds, 5¢ off list.
In lots less than 100 ℔, ₱ ℔, add ½¢, 1 ℔ boxes add 1¢ to list.

Oakum.
Government.....₱ ℔ 8½¢
U. S. Navy.....₱ ℔ 7¾¢
Navy.....₱ ℔ 7 ¢

Oilers.—Zinc and Tin.....dis 65 @ 65&10 %
Brass and Copper.....dis 50&10@50&10&5 %
Malleable, Hammers' Improved, No 1, $3.50; No. 2, $4.00; No. 3, $4.50 ₱ doz.....dis 10 @ 10&10 %
Malleable, Hammers, Old Pattern, same list....dis 40 %
Prior's Patent or "Paragon" Zinc.....dis 60&10&10 %
Prior's Patent or "Paragon" Brass.....dis 50 %
Olmstead's Tin and Zinc.....dis 60 %
Olmstead's Brass and Copper.....dis 50 %
Broughton's Zinc.....dis 60 %
Broughton's Brass.....dis 50 %

Packing, Steam.

Rubber—
Standard.....dis 60&10 @ 60&10&10 %
Extra.....dis 50&10 @ 60 %
N. Y. B. & P. Co., Standard.....dis 50&10&5 %
N. Y. B. & P. Co., Empire.....dis 70 %
N. Y. B. & P. Co., Salamander.....₱ ℔ 65¢, dis 30 %
Jenkins' Standard.....₱ ℔ 80¢, dis 35 %

Miscellaneous—
American Packing.....10¢ @ 11¢ ₱ ℔
Russia Packing.....14¢ ₱ ℔
Italian Packing.....12 @ 14¢ ₱ ℔
Cotton Packing.....15 @ 17¢ ₱ ℔
Jute.....7 @ 8¢ ₱ ℔

Padlocks.—See Locks.

Pails.
Galvanized Iron—

Quarts	10	12	14
Bill's Light Weight, ₱ doz	$2.75	3.00	3.25
Bill's Heavy Weight, ₱ doz	3.00	3.25	3.75
Whiting's	2.75	3.00	3.25
Sidney Shepard & Co	2.67	....	3.23
Iron Clad	2.75	3.00	3.25
Fire Buckets	2.75	3.25	3.50

Buckets, see Well Buckets.

Indurated Fibre Ware—
Star Pails, 12 qt.....₱ doz $4.50
Fire, Stable and Milk, 14 qt.....₱ doz $5.50

Pencils. Faber's Carpenters'.....high list, dis 50 %
Faber's Round Gilt.....₱ gro $5.25 net
Dixon's Lead.....₱ gro $4.50 net
Dixon's Lumber.....₱ gro $6.75 net
Dixon's "Carpenters".....dis 40&10 %

Picks.
Railroad, 5 to 6, $12.00; 6 to 7, $13...dis 60&5 @ 60&10 %
Adze Eye, 5 to 6, $12.00; 6 to 7, $13...dis 60&5 @ 60&10 %

Picture Nails.
Brass Head, Sargent's list.....dis 50&10&10 %
Brass Head, Combination list.....dis 50&10 %
Porcelain Head, Sargent's list.....dis 50&10&10 %
Porcelain Head, Combination list.....dis 40&10 %
Niles' Patent.....dis 40 %

Pinking Irons......₱ doz 65¢ net

Pipe, Wrought Iron.—List March 23, 1887.
1¼ and under, Plain.....dis 47½ %
1¼ and under, Galvanized.....dis 37½ %
1½ and over, Plain.....dis 57½ %
1½ and over, Galvanized.....dis 45 %
Boiler Tubes, Iron.....dis 52½ %

Planes and Plane Irons.
Wood Planes—
Molding.....dis 50 @ 50&5 %
Bench, First Quality.....dis 60 @ 60&5 %
Bench, Second Quality.....dis 60&10 %
Bailey's (Stanley R. & L. Co.).....dis 30&10 %
Iron Planes—
Bailey's (Stanley R. & L. Co.)...dis 30&10@30&10&5 %
Miscellaneous Planes (Stanley R. & L. Co.)..dis 20&10 %
Victor Planes (Stanley R. & L. Co.).....dis 20& 10 %
Steer's Iron Planes.....dis 35 @ 35&5 %
Meriden Mal. Iron Co.'s.....dis 30&10@30&10&10 %
Davis's Iron Planes.....dis 30&10@30&10&10 %
Birmingham Plane Co.....dis 50@50&5 %
Gage Tool Co.'s Self-Setting.....dis 20 %
Plane Irons—
Plane Irons.....dis 20&10 %
Plane Irons, Butcher's.....$5.00 @ $5.25 to 2
Plane Irons, Buck Bros.....dis 30 %
Plane Irons, Middlesex Mfg. Co., "Baldwin Iron," Single and Cut.....dis 20 @ 25 %
Double.....dis 33⅓ @ 40 %
L. & I. J. White.....dis 25 %

Pliers and Nippers.
Button's Patent.....dis 30&10 @ 40 %
Ball's Pat. Compound Lever Cutting Nippers, No. 2, 5 in., $13.50; No. 4, 7 in., $21.00 ₱ doz dis 20&10@33⅓&5 %
Humason & Beckley Mfg. Co.....dis 50@50&10 %
Gas Pliers.....dis 60 %
Gas Pliers, Custer's Nickel Plated.....dis 60&5 %
Eureka Pliers and Nippers.....dis 40 %
Russell's Parallel.....dis 25 %
P. S. & W. Cast Steel.....dis 50 %
P. S. & W. Tinners' Cutting Nippers....add 6 % dis 10 %
Carew's Pat. Wire Cutters.....dis 20 %
Morrill's Parallel, per doz., $12.....dis 30&5 %
Cronk's 8 in., $15; 10 in., $21.....dis 40 %

Plumbs and Levels.
Regular List.....dis 70&10@70&10&10 %
Disston's.....dis 45&10 %
Pocket Levels.....dis 70&10@70&10&10 %
Davis Iron Levels.....dis 30 %
Davis' Inclinometers.....dis 10&10 %

Poppers, Corn.
Round or Square, 1 qt.....₱ gro $10.50 @ $12
Round or Square, 2 qt.....₱ gro $23.50 @ $24

Post Hole and Tree Augers and Diggers.
Samson Post Hole Digger.....₱ doz $36.00, dis 25&10 %
Fletcher Post Hole Augers.....₱ doz $36.00, dis 20 %
Eureka Diggers.....₱ doz $16 @ $17
Leed's.....₱ doz $8.00 @ $9.00
Vaughan's Post Hole, Auger, per doz, $24.00... dis 40 %
Kohler's Little Giant.....₱ doz $18.00
Kohler's Hercules.....₱ doz $16.00
Kohler's New Champion.....₱ doz $9.00
Schneidler.....₱ doz $16 @ $17
Ryan's Post Hole Diggers.....₱ doz $24
Cronk's Foot Bars.....doz $60, dis 50&5 @ 50&10 %
Gibb's Post Hole Digger, ₱ doz $30....dis 40 @ 40&10 %

Potato Parers.
White Mountain.....₱ doz $5.00 @ 5.50
Antrim Combination.....₱ doz $8.00
Hoosier.....₱ doz $13.50

Pruning Hooks and Shears.
Disston's Combined Pruning Hook and Saw, ₱ doz $18.00.....dis 20&10 %
Disston's Pruning Hook.....₱ doz $12.00, dis 30&10 %
E. S. Lee & Co.'s Prunin Tools.....dis 40 %
Pruning Shears, Henry Pat...₱ doz $3.75 @ $4.00 net
Henry's Pruning Shears.....₱ doz $4.25 @ $4.50 net
Wheeler, M. & Co.'s Combination...₱ doz $12, dis 20 %
Dunlap's Saw and Chise.....₱ doz $8.50, dis 30 %
J. Mallinson & Co.....No. 1, $5.25; No. 2, $7.25

Pulleys.—Hot House, Awning, &c.....dis 60&10 %
Japanned Screw.....dis 60&10 %
Brass Screw.....dis 60&10 %
Japanned Side.....dis 66⅔&10 %
Japanned Clothes Line.....dis 60&10 %
Empire Sash Pulley.....dis 55 @ 60 %

Hay Fork, Solid Eye, $4.00; Swivel, $4.50 } dis 50&10 @ 50&10&5 %

Hay Fork, "Anti-Friction," 5 in. Solid, $5.70...dis 50 %
Hay Fork, "P" Common and Pat. Bushed.....dis 20 %
Hay Fork, Tarbox Pat. Iron.....dis 20 %
Hay Fork, Reed's Self-Lubricating.....dis 60 %
Shade Rack.....dis 45 %
Tackle Blocks.....See Blocks

Pumps.—Cistern, Best Makers.....dis 50 @ 10&60 %
Pitcher Spout, Best Makers...dis 60&10 @ 60&10&10 %
Pitcher Spout, Cheaper Goods..dis 70&5 @ 70&10&5 %

Punches.
Saddlers' or Drive, good quality.....₱ doz 60¢ @ 65¢
Bemis & Call Co.'s Cast Steel Drive.....dis 50&5 %
Bemis & Call Co.'s Springfield Socket.....dis 50&5 %
Spring, good quality.....₱ doz $2.50 @ $2.60
Spring, Leach's Patent.....dis 15 %
Bemis & Call Co.'s Spring and Check.....dis 40 %
Solid Tinners'.....₱ doz $1.44, dis 55 %
Tinners' Hollow Punches.....dis 20&2 %

Rail.
Sliding Door, Wrt. Brass ₱ ℔ 35¢, dis 20 @ 20&5 %
Sliding Door, Bronzed Wrt. Iron.....₱ foot 7¢
Sliding Door Iron, Painted....₱ foot 4¢, dis 20&10&5 %
Barn Door, Light....Inch. ⅜ ½ ⅝ ¾
Per 100 feet..... $2.50 3.00 4.10—dis 10 %
B. D. for N. E. Hangers—

	Small.	Med.	Large
Per 100 feet.....	$2.15	2.70	3.25 net

Terry's Wrought Iron, ₱ foot.....4½¢ @ 5¢
Victor Track Rail, 7¢ ₱ foot.....dis 50&2 %

Rakes.
Cast Steel.....dis 65&5 @ 70 %
Malleable.....dis 70 @ 70&5 %
Gibbs Lawn Rake.....$12, dis 40 %
Canton Lawn Rake.....$9, dis 40 %
Ft. Madison Prize Bow Brace and Peerless..dis 65&5 %
Fort Madison Steel Tooth Lawn Rake, $6.....dis 25 %

Razors.—J. R. Torrey Razor Co.....dis 20%
Wostenholme and Butcher.....$10 to $, dis 10 %

Razor Strops.
Genuine Emerson.....dis 60 @ 60&5 %
Imitation Emerson.....₱ doz $2.00, dis 20&10&5 %
Torrey's.....dis 20 %
Badger's Belt and Combination.....₱ doz $2
Lamont Combination.....₱ doz $4

Rivets and Burrs.
Copper.....dis 50, with Jobbers' Extras.
Iron, list November 17, 1887.....dis 50 %

Rivet Sets......dis 50&2 @ 50&10 %

Rods.—Stair, Brass.....dis 25&2 %
Stair, Black Walnut.....₱ doz 40¢

Rollers.
Barn Door, Sargent's list.....dis 60&10&10 %
Acme (Anti-Friction).....dis 55 %
Union Barn Door Roller.....dis 70 %

Rope.—Manufacturers' prices for large lots.
Manila.....⅜ inch and larger ₱ ℔ 10½¢ net
Manila.....¼ inch ₱ ℔ 11½¢ net
Manila.....⅛ and 5-16 inch ₱ ℔ 11½¢ net
Manila.....Tarred Rope ₱ ℔ 10 ¢ net
Manila, Hay Rope.....₱ ℔ 10½¢ net
Sisal.....⅜ inch and larger ₱ ℔ 9½¢ net
Sisal.....¼ inch ₱ ℔ 10½¢ net
Sisal.....⅛ and 5-16 inch ₱ ℔ 10½¢ net
Sisal, Hay Rope.....₱ ℔ 9½¢ net
Sisal, Tarred Rope.....₱ ℔ 9½¢ net
Sisal, Medium Lath Yarn.....₱ ℔ 8½¢ net
Cotton Rope.....₱ ℔ 15 @ 18¢ net
Jute Rope.....₱ ℔ 7¢

Dis ½% for cash in 10 days.

Rules.
Boxwood.....dis 80&10 @ 80&10&10 %
Ivory.....dis 50 @ 55&10 %

Sad Irons.
From 4 to 10, at factory.....₱ 100 ℔ $2.75 @ $2.85
Self-Heating.....₱ doz. $9.00 net
Self-Heating, Tailors'.....₱ doz. $18.00 net
Gleason's Shield and Toilet.....dis 25 %
Mrs. Potts's Irons.....dis 40@40&5 %
Enterprise Star irons, new list, July 20, 1882...dis 40 %
Combined Fluter and Sad Iron...₱ doz. $15.00, dis 15 %
Fox Reversible, Self-Fluter.....₱ doz., $24.00 net
Chinese Laundry (N. E. Butt Co.).....8½¢, dis 15 %
New England.....5¢, dis 15 %

Sand and Emery Paper and Cloth.
List April 19, 1886.....dis 20 %
Sibley's Emery and Crocus Cloth.....dis 30 %

Sash Cord.
Common.....₱ ℔, 10¢ @ 11¢
Patent, good quality.....₱ ℔, 13¢ @ 13½¢
White Cotton Braided, fair quality.....₱ ℔ 28¢ @ 29¢
Common Russia Sash.....₱ ℔ 13½¢
Patent " " .....₱ ℔ 15¢
Cable Laid Italian " .....₱ ℔ 22¢ @ 23¢
India Cable Laid " .....₱ ℔ 15¢
Silver Lake, A Quality, White.....50%, dis 10&10&5 %
Silver Lake, A Quality, Drab.....55¢, dis 10&10&5 %
Silver Lake, B Quality, White.....60¢, dis 20&10&5 %
Silver Lake, B Quality Drab.....60¢, dis 20&10&5 %
Silver Lake, C Quality, White (only).....27¢ @ 28¢
Sylvan Spring, Extra Braided, White.....34¢
Sylvan Spring, Extra Braided, Drab.....30¢
Semper Idem, Braided, White.....30¢
Egyptian, India Hemp, Braided.....25¢
Samson, Braided, White Cotton.....50¢ dis 30 @ 30&5 %
Samson, Braided, Drab Cotton.....55¢ dis 30 @ 30&5 %
Samson, Braided Italian Hemp.....55¢ dis 30 @ 30&5 %
Samson Braided Linen.....80¢ dis 30 @ 30&5 %

Sash Locks.
Clark's No. 1, $10.00; No. 2, $8.00 ₱ gross.....dis 33⅓ %
Ferguson's.....dis 33⅓ %
Morris and Triumph, list Aug. 16, 1886.....dis 60&2 %
Victor.....60&10&2 %
Walker's.....dis 10 %
Attwell Mfg. Co.....dis 25 @ 33⅓ %
Reading.....dis 66⅔&10 @ 66⅔&10&10 %
Hammond's Window Springs.....dis 40 %
Common Sense, Jap'd, Cop'd and Br'sed..₱ gross $4.00
Common Sense, Nickel Plated.....₱ gross $10.00
Universal.....dis 30 %
Kempshall's Gravity.....dis 60 %
Kempshall's Model.....dis 60@60&10 %
Corbin's Daisy, list February 15, 1886.....dis 70 %
Payson's Perfect.....dis 50&10&5 @ 60 %
Hugunin's New and Improved Adjustable Sash Balances, list Jan. 5, 1887.....dis 25&5&2 %
Hugunin's New Sash Locks, list Jan. 5, '87.dis 25&5&2 %
Stoddard "Practical".....dis 10 %
Ives Patent.....dis 55 @ 55&5 %
Liesche's Nos. 100 & 110 ₱ gro. $8; 105, $10, dis 20&10 %
Davis, Bronze, Barnes Mfg. Co.....dis 50 %

Sash Weights.
Solid Eyes.....₱ ton. $22.50 @ $25

Sausage Stuffers or Fillers.
Miles' "Challenge".....₱ doz. $30, dis 50&50&5 %
Perry.....₱ doz. No. 1, $15; No. 0, $21, dis 50&50&5 %
Draw Cut No. 4.....each, $30.00, dis 20 %
Enterprise Mfg. Co.....dis 20&10 @ 30 %
Oliver's.....dis 40&10 %

Saws.
Disston's Circular....dis 45@45&5 %
Disston's Cross Cuts..dis 45@45&5 %
Disston's Hand.....dis 25@25&5 %
} Extras often given by jobbers.

Atkins' Circular.....dis 50 %
Atkins' Silver Steel Diamond X Cut.....₱ foot 75 ¢
Atkins' Concave Tooth Dexter X Cuts.....₱ foot 55 ¢
Atkins' Special Steel Diamond X Cuts.....₱ foot 32 ¢
Atkins' Champion and Electric Tooth X Cuts.....₱ foot 30 ¢
Atkins' Hollow Back X Cuts.....₱ foot 21 @ 22¢
Atkins' Shingle, Mulay, Drag, &c.....dis 45 %
W. M. & C., Hand.....dis 30&5 @ 30&10 %
W. M. & C. Champion X Cuts. Regular ₱ foot .24@26¢
W. M. & C. X Cuts. Thin Back.....₱ foot 27¢ @ 28¢
Peace Circular and Mill.....dis 45&10 %
Peace Hand Panel and Rip.....dis 30&10 @ 20&10&10 %
Peace Cross Cuts, Standard.....₱ foot 25¢
Peace Cross Cuts, Thin Back.....₱ foot 27¢@28¢
Richardson's Circular and Mill.....dis 45 @ 45&10 %
Richardson's X-Cuts, No. 1, 30¢; No. 2, 27¢; No. 3, 24¢

Hack Saws—
Griffin's Hack Saws, complete.....dis 40&10 @ 50 %
Griffin's Hack Saw, Blades only.....dis 40&10 @ 50 %
Star Hack Saws and Blades.....dis 25 %
Diamond Hack Saws and Blades.....dis 25 %
Eureka and Crescent.....dis 25 %

Saw Frames.
White Vermont.....₱ gro $9 @ $10
Red, Polished, and Varnished....₱ doz $1.50, dis 25 %

Saw Sets.
Stillman's Genuine....₱ doz $5.00 and $7.75, dis 40&5 %
Stillman's Imita..₱ doz $3.25 and $5.25, dis 40&5 & 40&10%
Common Lever.....₱ doz $2.00, dis 40&5 %
Morrill's No. 1, $15.00; Nos. 3 & 4, $24.....dis 40&10@50&5 %
Leach's.....No. 0, $8.00; No. 1, $15.00, dis 15 @ 20 %
Nash's.....dis 20&10 @ 20&10&10 %
Hammer, Hotchkiss.....$5.50, dis 10 %
Hammer, Bemis & Call Co.'s new Patent...dis 30&5 %
Bemis & Call Co.'s Lever and Spring Hammer..dis 30&5 %
Bemis & Call Co.'s Plate.....dis 10 %
Bemis & Call Co.'s Cross Cut.....dis 13⅓ %
Aiken's Genuine.....$18.00, dis 50&10 %
Aiken's Imitation.....$7.00, dis 50&5 %
Hart's Patent Lever.....dis 20 %
Disston's, Star, No. 16, $5.50, dis 30&10@30&10&10 %
Atkins' Lever.....per doz No. 1, $6.00; No. 2, $9.60
Atkins' Criterion.....per doz $7.00 @ $7.50
Croissant (Keller), No. 1, $15.00; No. 2, $24.00, dis 33⅓&10 %

Saw Tools.
Atkins Perfection.....$15.00; Excelsior $6.00 ₱ doz.

Scales.
Hatch, Counter, No. 171, good quality.....₱ doz $21
Hatch, Tea, No. 161.....₱ doz $6.75 @ $7.00
Union Platform, Plain.....$2.30 @ 2.35
Union Platform, Striped.....$2.40 @ 2.50
Chatillon's Grocers' Trip Scales.....dis 50 %
Chatillon's Eureka.....dis 25 %
Chatillon's Favorite.....dis 40 %
Family, Turnbull's.....dis 30&10&10 %

Scale Beams.
Scale Beams, List of Jan. 12, 32..dis 50&10@50&10&5 %
Scale Beams, Custer.....dis 30@33⅓ %
Chatillon's No. 1.....dis 40 %
Chatillon's No. 2.....dis 50 %

Scrapers.
Adjustable Box Scraper (S. R. & L. Co.), $6.50, dis 30&10 %
Box, 1 Handle.....₱ doz $4.00, dis 10 %
Box, 2 Handle.....₱ doz $6.00, dis 10 %
Defiance Box and Ship.....dis 20&10 %
Foot.....dis 50&10@50 %
Ship, Common.....₱ doz $3.50 net
Ship, Providence Tool Co.....dis 10 %

Screen Window and Door Frames.
Porter's Pat. Window and Door Frame...dis 33⅓&10 %
Screen Corner Irons, Warner's.....dis 33⅓ @ 33⅓&10 %
Stearns' Frames and Corners.....dis 20&10 %

Screw Drivers.
Douglas Mfg Co.....dis 20&10&10 %
Disston's.....dis 45&10 %
Disston's Patent Excelsior.....dis 45&10 %
Buck Bros.....dis 30 %
Stanley R. & L. Co.'s Varnished Handles....dis 65&10 %
Stanley R. & L. Co.'s Black Handles.....dis 60&10 %
Sargent & Co.'s No. 1 Forged Blade.....dis 70&10&10 %
Sargent & Co.'s No. 20.....dis 60⅔&10&10 %
Sargent & Co.'s Nos. 40 & 30, Cast Steel.....dis 60&10 %
Sargent & Co.'s No. 60, Round Blade.....dis 70&10 %
Knapp & Cowles' No. 1.....dis 60&20 @ 70 %
Knapp & Cowles' No. 1 Extra.....dis 50 @ 60&10 %
Knapp & Cowles' No. 00 & 4.....dis 50&5 @ 50&10 %
Stearns'.....dis 25&10&5 %
Gay & Parsons.....dis 35 %
Champion.....dis 25 %
Clark's Patent.....dis 30 @ 33⅓ %
Crawford's Adjustable.....dis 30 %
Ellrich's Socket and Ratchet.....dis 25 @ 25&10 %
Allard's Spiral, new list.....dis 25 %
Kolb's Common Sense.....₱ doz $6, dis 25&10 %

Syracuse Screw-Driver Bits.....dis 30 & 30&5 %
Screw Driver Bits.....₩ doz, 50¢ @ 75¢
Screw Driver Bits, Parr's.....₩ gro. 6.25
Gray's Hol. Hdle, Sets, No. 3, $12.....dis. 25 @ 25 & 10 %
P. D. & Co.'s, all Steel.....dis 50 %

Screws
Wood Screws—List, Brass, Jan 27; Iron, July 1, 1887
Flat Head Iron.....dis 70 %
Round Head Iron.....dis 65 %
Flat Head Brass.....dis 65 %
Round Head Brass.....dis 60 %
Flat Head Bronze.....dis 65 %
Round Head Bronze.....dis 60 %
} Ex. 10 % often given by jobbers.

Machine—
Flat Head, Iron.....dis 55 ,
Round Head, Iron.....dis 50 %
Bench and Hand—
Bench, Iron.....dis 55&10 @ 55&10&10 %
Bench, Wood, Beech.....₩ doz $2.25
Bench, Wood, Hickory.....dis 20&10 %
Hand, Wood.....dis 25&10 @ 25&10&5 %
Lag, Blunt Point.....dis 70 %
Coach and Lag, Gimlet Point.....dis 66⅔@66⅔&5 %
Bed.....dis 25&5 %
Hand Rail, Sargent's.....dis 60&10 %
Hand Rail, Humason, Beckley & Co.'s...dis 70&10@75 %
Hand Rail, Am. Screw Co.....dis 75 %
Jack Screws, Millers Falls list.....dis 50 @ 50&5 %
Jack Screws, P. S. & W.....dis 35 %
Jack Screws, Sargent.....dis 60&10 @ 40&10&5 %
Jack Screws, Stearns'.....dis 40 @ 40&10 %

Scroll Saws.
Lester, complete, $10.00.....dis 25 %
Rogers, complete, $4.00.....dis 25 %

Scythe Snaths.....dis 50&10 @ 60 %

Shears.
American (Cast) Iron.....dis 75&10 @ 75&10&5 %
Pruning.....See Pruning Hooks and Shears
Barnard's Lamp Trimmers.....₩ doz $3.75
Tinners'.....dis 20&2 %
Seymour's, List, Dec., 1881 dis 60&10&10@60&10&10&5 %
Heinsch's, List, Dec., 1881 .dis 60&10&10@60&10&10&5 %
Heinsch's Tailor's Shears.....dis 33⅓ %
First quality C. S. Trimmers.....dis 80@80&10 %
Second quality C. S. Trimmers. dis 80&10@80&10&10 %
Acme Cast Shears.....dis 10&10 %
Diamond Cast Shears.....dis 10 %
Clipper.....dis 10&10 %
Victor Cast Shears.....dis 75&10@75&10&5 %
Howe Bros. & Hulbert, Solid Forged Steel.....dis 40 %
Cleveland Machine Co., Solid Steel Forged.....dis 70 %

Sheaves.
Sliding Door—
M. W. & Co., list Jan. 1, 1887. ....dis 50&10 @ 60&5 %
R. & E., list Dec. 18, 1885.....dis 55&2 %
Corbin's list.....dis 60&10&2 %
Patent Roller.....dis 60&10&2 %
Patent Roller, Hatfield's .....dis 75 %
Russell's Anti-Friction, list Dec. 18, 1885..dis 60&2
Moore's Anti-Friction.....dis 60
Sliding Shutter—
R. & E. list Dec. 18, 1885.....dis 60&10&2 %
Sargent's list.....dis 60&10 %
Reading list.....dis 60&10&10 %

Ship Tools.
L. & I. J. White.....dis 20&5 %
Albertson Mfg. Co.....dis 25 %

Shoes, Horse, Mule, &c.
Horse—
Burden's, Perkins', Phoenix, at factory.....$4.00
Mule—Add $1 ₩ keg to above prices.
Ox, Wrought—
Ton lots.....₩ ℔ 9¢
1000 ℔ lots.....₩ ℔ 9½¢
500 ℔ lots.....₩ ℔ 10¢

Shot.—*(Eastern prices, 2¢ off, cash, 5 days.)*
Drop, ₩ bag, 25 ℔.....$1.50
Drop, ₩ bag, 5 ℔.....35
Buck and Chilled, ₩ 25-℔ bag.....$1.75
Buck and Chilled, ₩ 5-℔ bag.....40
(Western prices, 2¢ off, cash, 5 days.)
Drop Shot, ₩ bag, 25 ℔.....
Drop Shot, ₩ bag, 5 ℔.....
Buck and Chilled Shot, ₩ bag, 25 ℔.....
Buck and Chilled Shot, ₩ bag, 5 ℔.....
} See Trade Report.

Shovels and Spades.
Ames' Shovels, Spades, &c., list Nov. 1, 1885....dis 20 %
NOTE.—Jobbers frequently give 5 @ 7½ % extra on above.
Griffith's Black Iron.....dis 50&10 %
Griffith's C. S.....dis 50&10@60&5 %
Griffith's Solid Cast Steel R. R. Goods.....dis 20 %
Old Colony (Sanford Fork & Tool Co).....dis 20 %
St. Louis Shovel Co.....dis 15 @ 15&7½ %
Hussey, Binns & Co.....dis 15 @ 25 %
Hubbard & Co.....dis 20@20&7½ %
Lehigh Mfg. Co.....dis 50&10 %
Payne Pettebone & Son, list January, 1886....dis 30 %
Remington's (Lowman's Patent), ...dis 30&10 @ 40 %
Rowland's, Black Iron.....dis 50&10 %
Rowland's Steel.....dis 60 @ 60&5 %

Shovels and Tongs.
Iron Head.....dis 60&10@60&10&5 %
Brass Head.....dis 60&10&10 %

Skeins, Thimble.
Western list.....dis 75 @ 75&10 %
Columbus Wrt. Steel, list Nov. 1, 1887.....dis 20 %

Sieves.
Buffalo Metallic, S. S. & Co., new list.....dis 50&25 %
Barler Flour Sifters.....₩ doz $2.00
Smith's Adjustable Sifters.....₩ doz $2.25
Smith's Adjustable Milk Strainer.....₩ doz $2,00
Smith's Adjustab'e P. & C. Strainer.....₩ doz $1.75

Sieves, Wooden Rim—	Iron.	Plated.
Mesh 18, Nested, ₩ doz.....	70¢	90¢
Mesh 20, Nested, ₩ doz.....	85¢	$1.00
Mesh 24, Nested, ₩ doz.....	$1.00	1.10

Slates.—School, by case.....dis 40&10 %

Snaps, Harness, &c.
Anchor (T. & S. Mfg Co.).....dis 65 %
Fitch's (Bristol).....dis 50&10 %
Hotchkiss.....dis 10 %
Andrews.....dis 80 %
Sargent's Patent Guarded.....dis 70&10&10 %
German, new list.....dis 40&10 %
Covert.....dis 50&2 %
Covert, New Patent.....dis 50&5&2 %
Covert New R. S.....dis 60&2 %
Covered Spring.....dis 60&10&10 %

Soldering Irons.
Covert's Adjustable, list Jan. 1, 1886.....dis 35&2 %

Spoke Shaves.—Iron.....dis 45 %
Wood.....dis 30 %
Bailey's (Stanley R. & L. Co.).....dis 40&10 %
Stearns'.....dis 20&10 @ 30 %

Spoke Trimmers.
Bonney's.....₩ doz $10.00, dis 50 %
Stearns'.....dis 20&10 %
Ives'.....No. 1, $15.00; No. 2, $12.00 ₩ doz, dis 55&10 %
Douglass'.....₩ doz $9.00, dis 20 %

Spoons and Forks.
Tinned Iron—
Basting, Central Stamping Co.'s list. dis 70@70&10 %
Solid Table and Tea, Central Stamping Company's list.....dis 70@70&10 %
Buffalo, S. S. & Co.....dis 33⅓&2 %
Silver-Plated—
Meriden Brit. Co., Rogers.....dis 50&5 %
C. Rogers & Bros.....50&5 %
Rogers & Bro.....50&5 %
Reed & Barton.....dis 50&5 @ 50&10&5 %
Wm. Rogers Mfg. Co.....dis 50&10 @ 60 %
Simpson, Hall, Miller & Co.....dis 50&10&5 @ 60 %
Holmes & Edwards Silver Co.....dis 50&10&5@60 %
H. & E. Silver Co. Mexican Silver.....dis 50&5 %
H. & E. Silver Co., Durham Silver .....dis 50&5 %
German Silver.....dis 50 @ 50&5 %
German Silver, Hall & Elton.....dis 40&5 %
Nickel Silver.....dis 50&5@50&10&5 %, cash
Britannia.....dis 55 %

Springs.
Elliptic, Concord, Platform and Half Scroll.....dis 60 @ 60&5 %
Cliff's Bolster Springs.....dis 25 %

Squares.
Steel and Iron.....
Nickel-Plated.....
} dis 70&10 %
Try Square and T Bevels.....dis 60&10&10 @ 70 %
Disston's Try Square and T Bevels.....dis 45&10 %
Winterbottom's Try and Miter.....dis 30&10 %

Staples.
Fence Staples, Galvanized.....₩ ℔, 4 @ 4¼¢
Fence Staples, Plain.....₩ ℔, 3 @ 3¼¢

Steelyards......dis 40&10@50&5 %

Stocks and Dies.
Blacksmith's, Waterford Goods....dis 30&5 @ 30&10 %
Lightning Screw Plate.....dis 25 @ 30 %
Reece's New Screw Plates.....dis 33⅓ @ 33⅓&5 %

Stone.
Hindostan No. 1, 3¢; Axe, 3½¢; Slips No. 1, 5¢.
Sand Stone.....₩ ℔, 2¢
Washita Stone, Extra.....₩ ℔, 1 @ 22¢
Wasnita Stone, No. 1.....₩ ℔, 15 @ 16¢
Washita Stone, No. 2.....₩ ℔, 11 @ 12¢
Washita Slips, No. 1. Extra.....₩ ℔, 40 @ 42¢
Washita Slips, No. 1.....₩ ℔, 30 @ 32¢
Arkansas Stone, No. 1, 4 to 6 in.....₩ ℔, $1.35
Arkansas Stone, No. 1, 6 to 9 in.....₩ ℔, $1.75
Turkey Oil Stone.....4 to 8 in., ₩ ℔, 40¢
Turkey Slips.....₩ ℔, $1.00 @ $1.50
Lake Superior, Chase.....₩ ℔, 16¢
Lake Superior Slips, Chase.....₩ ℔, 31@32¢
Seneca Stone, Red Paper Brand, ₩ ℔.....18 @ 20¢
Seneca Stone, High Rounds, ₩ ℔.....20 @ 25¢
Seneca Stone, Small Whets, ₩ gro.....$24.00

Stove Polish.
Joseph Dixon's.....₩ gro $6.00, dis 10 %
Gem.....₩ gro $4.50, dis 10 %
Gold Medal.....₩ gro $6.00, dis 25 %
"Mirror".....₩ gro $6.00, dis —%
Lustro.....₩ gro $4.75 net
Ruby.....₩ gro $3.75 net
Rising Sun, 5 gro. lots.....₩ gro $5.50
Dixon's Plumbago.....₩ ℔ 8¢ net
Boynton's Noon Day, ₩ gro.....$5.00
Parlor Pride Stove Enamel.....₩ gross, $13

Yates' Liquid,	2	3	5	10 gal. cans
₩ gal...	$0.90	.80	.70	.60

Yates Standard Paste Polish, 10-lb cans, per lb., 15 ¢
Jet Black.....₩ gro $3.50
Japanese.....₩ gro $3.50
Fireside.....₩ gro $2.50

Tacks, Brads, &c.
List, Jan. 2, 1888.
American Iron Carpet Tacks.....dis 72½&10&2 %
Steel Carpet Tacks.....dis 72½&10&2 %
Swedes Iron Carpet Tacks.....dis 72½&10&2 %
American Iron Cut Tacks.....dis 70&10&2 %
Swedes Iron Tacks.....dis 67½&10&2 %
Swedes Iron Upholsterers' Tacks...dis 67½&10&2 %
Tinned Swedes Iron Tacks.....dis 67½&10&2 %
Tin'd Sw'des Iron Uphol'ers' Tacks. dis 67½&10&2 %
Gimp and Lace Tacks.....dis 67½&10&2 %
Tinned Gimp and Lace Tacks.....dis 67½&10&2 %
Swedes Iron Trimmers' Tacks ....dis 67½&10&2 %
Swedes Iron Miners' Tacks .....dis 67½&10&2 %
Swedes Iron Bill Posters' or Railroad Tacks.....dis 67½&10&2 %
Swedes Steel Tacks, all kinds (Swedes Iron price list).....dis 72½&10&2 %
Copper Tacks.....dis 3 ½&10&2 %
Copper Finishing Trunk and Clout Nails.....dis 33⅓&10&2 %
Finishing Nails.....dis 60&10&2 %
Trunk and Clout Nails.....dis 60&10&2 %
Tinned Trunk and Clout Nails.....dis 60&10&2 %
Basket Nails.....dis 60&10&2 %
Common and Patent Brads.....dis 60&10a 2 %
Hungarian Nails.....dis 60&10&2 %
Chair Nails.....dis 60&10&2 %
Zinc Glaizers' Points.....dis 45&10&2 %
Cigar Box Nails.....dis 45&10&2 %
Picture-Frame Points.....dis 45&10&2 %
Looking-Glass Tacks.....dis 45&10&2 %
Leathered Carpet Tacks.....dis 45&10&2 %
Brush Tacks.....dis 45&10&2 %
Shoe Finders'.....List Jan. 2, 1888. dis 10 @ 10&5 %
Lining and Saddle Nails, List Jan. 1, 1886:
Silvered.....dis 30&10&10 %
Japanned.....dis 20&10&10 %
Double-pointed Tacks.....85 %
Wire Carpet Nails.....dis 50&10 %
Steel Wire Brads, R. & E. Mfg. Co.....dis 50&10 %

Ex. ra 10 % often given.

Tap Borers.
Common and Ring.....dis 20&10 %
Ives' Tap Borers.....dis 33⅓&5 %
Enterprise Mfg. Co.....dis 20&10 @ 30 %
Clark's.....dis 33⅓ @ 35 %

Tapes, Measuring.—American.....dis 25&10 %
Spring.....dis 40 %
Chesterman's.....Regular list dis 25 @ 30 %

Thermometers.—Tin Case.....dis 80 @ 80&10 %

Thimble Skeins.—See Skeins.

Ties, Bale.
Steel Wire, Standard list .....dis 50&10&5 %

Tinners' Shears, &c.
Shears and Snips (P. S. & W.).....dis 20 @ 25 %
Punches—See Punches.
Snips, J. Mallinson & Co.....dis 33⅓&2 %

Tinware.
Stamped, Japanned & Pieced, list Jan. 20, 1887.....dis 70 @ 70&10&5 %

Tobacco Cutters.
Enterprise Mfg. Co. (Champion).....dis 20&10 @ 30 %
Wood Bottom.....₩ doz $5.00 @ $5.25
All Iron.....₩ doz $4.25
Nashua Lock Co.'s.....₩ doz $18.00, dis 50 @ 55 %
Wilson's.....dis 55 %
Clipper (Sargent & Co.).....₩ doz $24, dis 50&10&10 %
Acme.....₩ doz $20.00, dis 40 %

Transom Lifters.
Wollensak's Patent Iron Bronsed.....dis 50 %
Reiher's Bronzed Iron Rods list Jan. 1, 1887. dis 50&2 %
Reiher's Real Bronze or Nickel Plate, list Jan. 1, 1887.....dis 50&2 %
Excelsior.....dis 50&10&2 %
Shaw's.....dis 50&10 %
Payson's Universal.....dis 40 %
Crown and Star.....dis 50 %

Traps.
Game—
Newhouse.....dis 35 @ 40&5 %
Oneida Pattern.....dis 60&10&10 @ 70 %
Game, Blake's Patent.....dis 40&10&5 %
Mouse and Rat—
Mouse, Wood, Choker.....₩ doz holes. 11@12¢
Mouse, Round Wire.....₩ doz $1.50, dis 10 %
Mouse, Cage, Wire.....₩ doz $2.50, dis 10 %
Mouse, Catch-'em-alive.....₩ doz $2.50, dis 15 %
Mouse, "Bonansa".....₩ gross $10 net
Mouse, Delusion.....₩ gross $18.00, dis 15 %
Rat, "Decoy".....₩ gross $10.00, dis 10 %
Ideal.....₩ gross $10
Cyclone.....₩ gross $5.25
Hotchkiss Metallic Mouse, 5 hole traps....₩ doz 90¢
In full cases.....₩ doz 75¢

Trowels.
Lothrop's Brick and Plastering.....dis 25
Reed's Brick and Plastering.....dis 15 %
Disston's Brick and Plastering.....dis 25 @ 25&10 %
Peace's Plastering.....dis 25 %
Clement & Maynard's.....dis 20 %
Rose's Brick.....dis 15 @ 20 %
Brade's Brick.....dis 25 %
Worrall's Brick and Plastering.....dis 20
Garden.....dis 70 %

Triers.—Butter and Cheese.....dis 25 %

Trucks, Warehouse, &c.
B. & L. Block Co.'s list, 1882.....dis 40 %

Tubes, Boiler.—See Pipe

Twine.

	BC.	B.
No. 9, Flax Twine, ¼ and ½ ℔ Balls	23¢	31¢
No. 12, " " ¼ and ½ "	21½¢	30¢
No. 18, " " ¼ and ½ "	18½¢	29¢
No. 24, " " ¼ and ½ "	20¢	29¢
No. 36, " " ¼ and ½ "	17½¢	28¢
No. 264, Mattrass, ¼ and ½ "		48¢
Chalk Line, Cotton, ½ ℔ Balls		25¢
Mason Line, Linen, ½ "		56¢
2-Ply Hemp, ¼ and ½ ℔ Balls (Spring Twine)		12¢
3-Ply Hemp, 1 ℔ Balls		12½¢
3-Ply Hemp, 1½ ℔ Balls		11½¢
Cotton Wrapping, 5 Balls to ℔		15¢ @ 18¢
2, 3, 4 and 5 Ply Jute, ½ ℔ Balls		9½¢
Wool		5½¢ @ 6¢
Paper		13¢ @ 14¢
Cotton Mops—6, 9, 12 and 15 ℔ to dos		18¢

Vises.
Solid Box.....dis 50&10&5 @ 60 %
Parallel—
Fisher & Norris Double Screw.....dis 15&10 %
Stephens'.....dis 25 %
Parker's.....dis 20 @ 25 %
Wilson's.....dis 55 %
Howard's.....dis 40 %
Bonney's.....dis 40%
Millers Falls.....dis 40 @ 40&10 %
Trenton.....dis 40&5 @ 40&10 %
Merrill's.....dis 15@20 %
Sargent's.....dis 60&10&10 %
Backus and Union.....dis 40 %
Double Screw Leg.....dis 15&10 %
Prentiss.....dis 20&5 @ 25 %
Simpson's Adjustable.....dis 40 %
Saw Filers—
Bonney's, Nos. 2 & 3.....₩ doz $15.00, dis 40 %
Stearn's.....dis 33⅓&10 @ 33⅓&10&10 %
Stearn's Silent Saw Vises.....dis 33⅓ @ 35 %
Sargent's.....dis 60&10&10 %
Hopkins'.....₩ doz $17.50, dis 10 %
Reading.....dis 40&10 %
Wentworth.....dis 20&10 %
Combination Hand Vise.....₩ gro, $42.00
Cowell Hand Vises.....dis 20 %
Bauer's Pipe Vises.....dis 10 %

Wagon Boxes.
Per lb.....2½¢

Washer Cutters.
Smith's Patent.....₩ doz $12.00, dis 20&10&10 %
Johnson's.....₩ doz $11.00, dis 33⅓ %
Penny's.....₩ doz Pol. $14; Jap'd. $16..dis 50 %
Appleton's .....₩ doz $16.00, dis 60&10 %
Bonney's .....dis 30&10 %

Washers.—See Nuts and Washers.

Wedges.—Iron.....₩ ℔ 3½¢
Steel.....₩ ℔ 4 ¢

Well Buckets, Galvanized.
Hill's.....₩ doz ..12 qt., $4.25 : 14 qt., 15 25
Iron Clad.....₩ doz., 14 qt., $4.25 @ $4.50
Whiting's Flat Iron Band.....₩ doz $4.25 @ $4.50
Whiting's Wired Top.....₩ doz $4.00 @ $ 25

Well Wheels—8 in., $2; 10 in., $2.25; 12 in., $3.25

Wire.
Iron—
Market, Br. & Ann..Nos.0 to 18.....dis 70&10@75 %
Market, Coppered, Nos. 0 to 18.....dis 70@70&10 %
Market, Galvanized, Nos. 0 to 18.....dis 65@65&10 %
Market, Tin d, Tinned list Nos. 0 to 18.dis 65@65&5 %
Stone Br. & Ann'd, Nos. 16 to 18 ...dis 72½@72½&5 %
Stone, Bright and Ann'd, Nos. 19 to 26. .dis 75@75&5 %
Stone, Br. & Ann'd, Nos.27 to36.dis 75&10@75&10&5 %
Stone, Tin d, Tin'd list, Nos. 18 to 36..dis 70@70&10 %
Tinned Broom Wire, Nos. 18 to 24..dis 72½@72½&5 %
Galvanized Fence.....dis 65@65&5 %
Annealed Fence, Nos. 8 & 9.....dis 70@70&5 %
Annealed Grape, Nos. 10 to 14 .....dis 70@70&5 %
Brass and Copper, list, Jan.18,'84.....dis 15 @ 20 %
Barb Fence.....See Trade Report
Wire on Spools.....dis 65 %
Malin's Steel and Tinned Wire on Spools.....dis 50 %
Malin's Brass and Copper Wire on Spools.....dis 40 %
Cast Steel Wire.....dis 50 %
Stubs' Steel Wire.....$6.00 to $, dis 30 %
Steel Music Wire, Nos. 12 to 30.....55¢ ₩ ℔
Picture Wire.....dis 60&10 %
Barb Wire Safety Guards.....₩ 1000 $9.00, dis 25 %
Wire Clothes Lines. See Lines.

Wire Cloth, green, drab and black, ₩ 100 sq.
No. 34 Wire, $1.90; No. 33 Wire. $2.00

Wire Goods.—See Bright Wire Goods.

Wire Rope.—List May 1. 1886.....dis 33⅓

Wrenches.—American Adjustable.....dis 45 %
Baxter's Adjustable "S".....dis 35&10 %
Baxter's Diagonal.....dis 40 @ 40&10
Coes' Genuine.....dis 55&2 %
Coes' "Mechanics'".....dis 55&10&2 %
Girard Standard.....dis 70&10 %
Lamson & Sessions' Engineers'.....dis 60&10 %
Lamson & Sessions' Standard .....dis 70&10 %
Coes' Pattern, Wrought.....
Girard Agricultural.....
Lamson & Sessions' Agricultural.....
Sterling Wrought.....
} dis 80 @ 80&5 %
Bemis & Call's Patent Combination.....dis 35 %
Bem's & Call's Merrick's Pattern .....dis 35 %
Bemis & Call's Brigg's Patte.....dis 25 %
Bemis & Call's Cylinder or Gas Pipe .....dis 40&5 %
Remis & Call's No. 3 Pipe.....dis 35&5 %
Aiken's Pocket (Bright).....$6.00, dis 50&10 %
The Favorite Pocket (Bright).....₩ doz $4.00, dis 40 %
Webster's Patent Combination.....dis 25 %
Boardman's.....dis 25@25&10 %
Always Ready.....dis 25&5 %
Alligator.....dis 50 %
Donohue's Engineer.....dis 25 %
Acme, Bright.....dis 60&3 %
Acme, Nickeled.....dis 60&3 %
Walker's.....dis 55&3 %
Diamond.....dis 40 %
Diamond Patent Steel .....dis 40 %

Wrought Goods.
Staples Hooks, &c., list Jan. 12, '87.dis 80&20@85&10 %

CURRENT METAL PRICES.

FEBRUARY 1, 1888.

IRON AND STEEL.

Bar Iron from Store.

Common Iron :	
¾ to 2 in. round and square.. 1 to 6 in. x ¾ to 1 in.....	₱ lb 2.10 @ 2.20¢
Refined Iron :	
¾ to 2 in. round and square.. 1 to 4 in. x ¾ to 1½ in..... 4½ to 6 in. x ¾ to 1 in.....	₱ lb 2.25 @ 2.40¢
1 to 6 in. x ¼ and 5-16	₱ lb 2.45 @ 2.60¢
Rods—⅜ and 11-16 round and sq..	₱ lb 2.35 @ 2.50¢
Bands—1 to 6 x 3-16 to No. 12.....	₱ lb 2.50 @ 2.60¢
"Burden's Best" Iron, base price	₱ lb 3.00 @ ... ¢
Burden's "H. B. & S." Iron, base price	₱ lb 2.80 @ ....¢
"Ulster"	lb lb 3.10 @ ....¢
Norway Rods	4.00 @ 5.00¢

Sheet Iron from Store.

	Common American.	R. G. Cleaned.
10 to 16	₱ lb 2.75 @ 2.80¢	3.25 @ ....¢
17 to 20	₱ lb 2.85 @ 3.00¢	3.25 @ 3.50 ¢
21 to 24	₱ lb 3.00 @ 3.10¢	3.50 @ ....¢
25 and 26	₱ lb 3.20 @ ....¢	3.75 @ ....¢
27	₱ lb 3.75 @ 3.87½¢	4.00 @ ....¢
28	₱ lb 3.50 @ ....¢	4.00 @ ....¢

	B. B.	2d qual.
Galvanized, 14 to 20	₱ lb 4.87½¢	4.50 ¢
Galvanized, 21 to 24	₱ lb 5 25 ¢	4.87½¢
Galvanized, 25 to 26	₱ lb 5.75 ¢	5.25 ¢
Galvanized, 27	₱ lb 6.12½¢	5.62½¢
Galvanized, 28	₱ lb 6.50 ¢	6.00 ¢
Patent Planished	₱ lb A 10¢	B, 9¢
Russia	₱ lb 9½¢ @ 10¢	
American Cold Rolled B. B	₱ lb 5¢ @ 7¢	

STEEL.—DUTY. Ingots, Bars, Sheets, &c., valued at 4¢ ₱ lb or less, 45 % ad val.; valued above 4¢ and not above 7¢ ₱ lb, 2¢ ₱ lb; valued above 7¢ and not above 10¢ ₱ lb, 2¾¢ ₱ lb; valued above 10¢ ₱ lb, 3½¢ ₱ lb. *Extras*—Steel Bars, Rods, &c., cold hammered or polished in any way in addition to ordinary hot rolling, 1¼¢ ₱ lb in addition to above; Steel Circular Saw Plates, 1¢ ₱ lb in addition to the above.

Chrome Steel.

Tool Steel, ordinary sizes ⅝ to 3 inches. net	
Adamantine Shoes and Dies	
Magnet Steel	

English Steel from Store.

Best Cast	₱ lb 14½ @ 15 ¢
Extra Cast	₱ lb 16½ @ 17 ¢
Swaged, Cast	₱ lb 16 ¢
Best Double Shear	₱ lb 15 ¢
Blister, 1st quality	₱ lb 12½¢
German Steel, Best	₱ lb 10 ¢
2d quality	₱ lb 9 ¢
3d quality	₱ lb 8 ¢
Sheet Cast Steel, 1st quality	₱ lb 15 ¢
2d quality	₱ lb 14 ¢
3d quality	₱ lb 12½¢

METALS.

Tin.

	Per lb
Banca, Pigs	38 @ 38½¢
Straits, Pigs	38 @ 38½¢
English, Pigs	37½¢
Straits in Bars	39 @ 40 ¢

Tin Plates.

Charcoal Plates.—Bright.

		Per box.
Melyn Grade	IC, 10 x 14	$6.50
" "	IC, 12 x 12	6.75
" "	IC, 14 x 20	6.50
" "	IC, 20 x 28	13.00
" "	IX, 10 x 14	8.00
" "	IX, 12 x 12	8.25
" "	IX, 14 x 20	8.00
" "	IX, 20 x 28	16.00
" "	DC, 12½ x 17	6.00
" "	DX, 12½ x 17	7.50
Calland Grade	IC, 10 x 14	6.00
" "	IC, 12 x 12	6.25
" "	IC, 14 x 20	6 00
" "	IX, 10 x 14	7.50
" "	IX, 12 x 12	7.75
" "	IX, 14 x 20	7.50
Allaway Grade	IC, 10 x 14 @ $5.25	5.50
" "	IC, 12 x 12 @ 5.25	5.75
" "	IC, 14 x 20 @ 5.25	5.50
" "	IC, 20 x 28 @ 10.75	11.00
" "	IX, 10 x 14 @ 6.50	6.75
" "	IX, 12 x 12 @ 6.75	7.00
" "	IX, 14 x 20 @ 6.50	6.75
" "	IX, 20 x 28 @ 12.75	13.00
" "	DC, 12½ x 17 @ 5.00	5.25
" "	DX, 12½ x 17 @ 6.00	6.25

Coke Plates—Bright.

Steel Coke.—IC, 10 x 14, 14 x 20 @ $5.50	$5.10
10 x 20 @ 7.50	8.00
20 x 28 @ 10.00	10.25
IX, 10 x 14, 14 x 20	6.00
BV Grade.—IC, 10 x 14, 14 x 20	5.00

Charcoal Plates.—Terne.

Dean Grade.—IC, 14 x 20	$4 75
20 x 28 @ $9.25	9.50
IX, 14 x 20	5.75
20 x 28	11.50
Abecarne Grade.—IC, 14 x 20 @ $4.50	4.65
20 x 28 @ 9.00	9 25
IX, 14 x 20 @ 5.50	5.75
20 x 28	11.00

Tin Boiler Plates.

	Per pound.
IXX, 14 x 26 112 sheets	6¼¢
IXX, 14 x 28 112 sheets	6¼¢
IXX, 14 x 31 112 sheets	6¼¢

Copper.

DUTY: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ ₱ lb. Manufactured (including all articles of which Copper is a component of chief value), 45 % ad valorem.

Ingot.

Lake	17.50¢ @ 18¢
"Anchor" Brand	16.50¢ @ 17¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, December 10, 1887.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound. Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		25	25	25	26	27	28	31	33
30		72	25	25	25	26	28	30	34	...
36	96		25	25	25	27	29	33	36	....
36		96	25	25	26	28	30	34	38	....
48	96		25	25	27	29	31	35	....	....
48		96	25	25	28	30	32	36	....	....
60	96		25	25	30	32	37	....	....	....
60		96	25	25	31	....	....	....	....	....
84	96		26	27	..	....	....	....	....	....
84		96	27	28	....	....	....	....	....	....
Over 84 in. wide			28	30	....	....	....	....	....	....

All Bath Tub Sheets	16 oz.	14 oz.	12 oz.	10 oz.
Per pound	$0.28	0.30	0.32	0 35

Bolt Copper, ⅜ inch diameter and over, per pound ..... 35¢

Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 60 inches diameter, up to 96 inches diameter, inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.

Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.

Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

Copper Bottoms, Pits and Flats.

	Per pound.
14 ounce to square foot and heavier	28¢
12 ounce and up to 14 ounce to square foot	29¢
10 ounce and up to 12 ounce	31¢

Circles less than 8 inches diameter 2 cents per pound additional.

Circles over 13 inches diameter are not classed as Copper Bottoms.

Roll and Sheet Brass.

Discount from list ..... 10 @ 20 %

Spelter.

Duty: Pig, Bars and Plates, $1.50 ₱ 100 lb.

Western Spelter	5¾ @ 6¢
"Bergenport"	8½¢
"Bertha"	7¾ @ 8¢

Zinc.

Duty; Sheet, 2½¢ ₱ lb.

600 lb casks	6¾¢
Per lb	7 @ 7½¢

Lead.

Duty: Pig, $2 ₱ 100 lb. Old Lead, 2¢ ₱ lb. Pipe and Sheets, 3¢ ₱ lb.

American	@ 5¼¢
Newark	@ 5¼¢
Bar	5¾¢
Pipe	7½ %, dis 20 %
Tin-Lined Pipe	15¢, dis 20 %
Block Tin Pipes	55¢, dis 20 %
Sheet	6¼¢, dis 20 %

Solder.

½ @ ½ (Guaranteed)	24¢
Extra Wiping	20¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson	₱ lb 15¢
Hallett's	" 13¢

FRENCH GLASS.

January 20, 1887—Per Box 50 feet.

Sizes.		Single. 1st. E F H	2d. I E H	3d. H H	4th. H B
25	6 x 8 to 10 x 15	$10.50	$9.00	$8.50	$8.00
40	11 x 14 to 16 x 24	11.50	10.75	10.25	9.75
50	18 x 22 to 20 x 30	15.50	14.00	13.00	12.50
54	15 x 36 to 24 x 30	16.50	15.00	13.50	....
60	26 x 28 to 24 x 36	17.75	16.25	14.75	....
70	26 x 36 to 26 x 44	19.00	17.50	15.25	....
80	26 x 46 to 30 x 50	21.00	19.50	17.00	....
84	30 x 52 to 30 x 54	22.00	20.25	18.00	....
90	30 x 56 to 34 x 56	23.00	21.25	19.00	....
94	34 x 58 to 34 x 60	24.00	22.75	21.00	....
100	36 x 60 to 40 x 60	26.50	24.50	23.00	....

Sizes.		Double. 1st. E F H D	2d. I E H D	3d. H H D	4th. H I D
25	6 x 8 to 10 x 15	$13.00	$12.50	$12.00	$11.50
40	11 x 14 to 16 x 24	16.00	15.00	14.50	....
50	18 x 22 to 20 x 30	20.50	19.50	18.50	....
54	15 x 36 to 24 x 30	22.00	20.75	19.50	....
60	26 x 28 to 24 x 36	25.00	23.00	21.50	....
70	26 x 36 to 26 x 44	26.00	25.00	23.00	....
80	26 x 46 to 30 50x	28.00	26.50	24.50	....
84	30 x 52 to 30 x 54	30.00	28.00	26.00	....
9.	30 x 56 to 34 x 56	31.00	30.00	28.00	....
94	34 x 58 to 34 x 60	32.50	31.00	29.00	....
100	36 x 60 to 40 x 60	36.00	32.50	32.00	....

Sizes above—$15 per box extry for everp 5 inches.
Discount—70 & 10 & 5 %.

AMERICAN GLASS.

Price Per Box of 50 Feet.

United Inches.	Sizes.	Single. AA	A	B	C
25	6 x 8 to 10 x 15	$10.50	$9.00	$8.50	$8.00
40	11 x 14 to 16 x 24	11.50	10.75	10.25	9.75
50	18 x 22 to 20 x 30	15.50	14.00	13.00	12.50
54	15 x 36 to 24 x 30	16.50	15.00	13.50	....
60	26 x 28 to 24 x 36	17.75	16.25	14 75	....
70	26 x 36 to 26 x 44	19.00	17.50	15.25	....
80	26 x 46 to 30 x 50	21.00	19.50	17 00	....
84	30 x 52 to 30 x 54	22.00	20.25	18.00	....
90	36 x 56 to 34 x 56	23 0s	21.25	19.00	....
94	34 x 58 to 34 x 60	24.00	22.75	21.00	....
100	36 x 60 to 40 x 60	20.50	24.50	23.00	....

United Inches.	Sizes.	Double. AA	A	B	C
25	6 x 8 to 10 x 15	$13.00	$12.50	11.00	$10.00
40	11 x 14 to 16 x 24	16.00	15 00	13.50	12.00
50	18 x 22 to 20 x 30	20.50	19.50	18 00	....
54	15 x 36 to 24 x 30	22.00	20.75	18.75	....
60	26 x 28 to 24 x 36	25.00	23.00	21.00	....
70	26 x 36 to 26 x 44	26.00	25.00	23.50	....
80	26 x 46 to 30 x 50	28.00	26.50	25.75	....
84	30 x 52 to 30 x 54	30.00	28.00	25.25	....
90	30 x 56 to 34 x 56	31.00	30.00	27.00	....
94	34 x 58 to 34 x 60	32.50	31.00	28.00	....
100	36 x 60 to 40 x 60	36.00	33.50	30.00	....

Sizes above—$10 per box extra for every 5 inches.
Discount—75 % single strength; 75 & 5 % double strength.

Oils.

Bleached Whale, ₱ gal	42 @ 45¢
Bleached Sperm, ₱ gal	65 @ 78¢
Fish Oil, Pressed	26¢
Lard, Prime Winter	63 @ 64¢
Cylinder Oil	70¢
Machinery	45¢
Engine	55¢
Linseed, Raw, in casks and bbls	55 @ 58¢
Linseed, Boiled, in casks and bbls	58 @ 62¢
Neatsfoot	45 @ 65¢
Cotton Seed, Refined	40 @ 41¢

Sundries.

Asphaltum, Cuban, ₱ lb	5½ @ 6¼¢
Asphaltum, Egyptian	8 @ 9½¢
Benzine, 62°, ₱ gal	8½ @ 9½¢
Coal Tar	₱ bbl., $3.00 and $4.00
Chalk, ₱ 100 lb	45¢
Chalk, Block	3¢
Crucibles, No 14 and upward, ₱ number	3½¢
Grain Emery, 300 lb kegs	4 @ 4½¢
Flour Emery, finest quality	2½ @ 2¾¢
Glue, White	18 @ 35¢
Glue, Sheet	13 @ 20¢
Glaziers' Points, Zinc, ₱ box	$4.75
Gum, Copal	36¢
Gum, Damar	25¢
Gum, Shellac, English	30¢
Gum, Shellac, English, dark	27¢
Mineral Wool, ordinary, ₱ lb	1 @ 1¼¢
Mineral Wool, extra	3 @ 3½¢
Naphtha, 70°	9 @ 10¢
Naphtha, 76°	9½ @ 10½¢
Pumice Stone, selected lumps	5 @ 6¢
Pumice Stone, powdered	2 @ 2½¢
Pine Tar, bbls	$2.10 @ $2.12½
Pitch	$1.40
Plumbago, E. I. Po., ₱ lb	4 @ 6¢
Plumbago, American, ₱ lb	6 @ 10¢
Plumbago, Gun Powder Glazing, ₱ lb	10¢
Plumbago, Shot Polish, ₱ lb	10¢
Putty, in bladders	2½¢
Putty, in bulk	1½ @ 2¢
Rosin, Strained and Good	$1.32½ @ $1.37½
Rosin, E. & F.	$1.45 @ $1.50
Rosin, G. & H.	$1.57½ @ $1.65
Rosin, I. & K.	$1.75 @ $1.85
Rosin, M. & N.	$2 00 @ $2.30
Spirits Turpentine, ₱ bbl	40½ @ 43¢
Stove Polish, Dixon's	₱ gross, $6.00
Stove Polish, Rising Sun	5.50
Stove Polish, Gem	4.50
Stove Polish, Jet Black	3.50
Waste, No. 1 Cop	8¾¢
Waste, No. 1 White Machine	8¾¢
Waste, No. 2 White Machine	8¼¢
Waste, No. 1 Colored	6¼¢
Waste, No. 2 Colored	5¾¢
Waste, Washed Machine	8¾¢
Whiting, Spanish, ₱ 100 lb	50¢